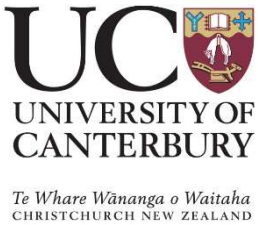

Dissociative Identity Disorder: Inter-Identity Transfer and Cognitive Processing of Episodic Memories

PhD thesis

To obtain the degree of Doctor of Philosophy at the University of Canterbury on the authority of Chancellor S. McCormack and Double Degree Doctor of Philosophy at the University of Groningen on the authority of the Rector Magnificus Prof. E. Sterken and in accordance with the decision by the College of Deans.

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Chapter 1

Literature Review: Inter-Identity Amnesia and Memory Retrieval

The aim of this literature review is to explore the current state of research of amnesia in DID. At present, DID research has assessed the extent of inter-identity amnesia for procedural, semantic, episodic and semantic autobiographical memory. Findings have indicated that despite the subjective reports of amnesia supported by results gained using measures of explicit memory retrieval, more objective tests tend to indicate a pattern of inter-identity transfer. As of yet, little research has explored episodic autobiographical memory in DID. As DID is a disorder characterised by separated identities that claim to have access to isolated episodic autobiographical memories, this memory system warrants further investigation.

Phenomenology and Prevalence

Dissociative Identity Disorder (DID) is regarded as the most chronic and severe of the dissociative disorders. The DSM-5 defines DID as a disruption of identity characterised by two or more distinct personality states. The disruption involves marked discontinuity of sense of self and sense of agency. Amnesia for everyday and/or traumatic events, as well as important personal information, is frequently reported (American Psychiatric Association [APA], 2013, p. 155).

In addition to the diagnostic symptoms, derealisation and depersonalisation are customary with a DID diagnosis (Dell, 2002). Derealisation is defined as one experiencing an alteration in their perception of the world around them, for example, feeling objects are distorted or unreal (Bernstein & Putnam, 1986; Waller, Putnam, & Carlson, 1996). Depersonalisation is defined as experiencing alterations in the perception of oneself such that a person may feel separated from their thoughts and actions, sometimes reporting they feel as though they do not belong to them (Bernstein & Putnam, 1986; Lynn, Lilienfeld, Merckelbach, Giesbrecht, & van der Kloet, 2012; Waller et al., 1996). Somatisation, characterised by the experiencing of physical manifestations in response to psychological turmoil, is also widely reported in DID (Pribor, Yutzy, Dean, & Wetzel, 1993; Walker, Gelfand, Gelfand, Koss, & Katon, 1995). Reported somatic experiences include physical pain, analgesia and inability to speak (Nijenhuis, 2001; Nijenhuis et al., 1999). The literature shows a high comorbidity between DID and posttraumatic stress disorder (PTSD), depression, personality disorders, anxiety disorders, substance abuse disorders and eating disorders (Boon & Draijer, 1993a; Dorahy et al., 2014; Ellason, Ross, & Fuchs, 1996; Kluft, 1983; Vermetten, Schmahl, Lindner, Loewenstein, & Bremner, 2006).

The reported prevalence rate of DID varies across the scientific literature, with research suggesting that the disorder occurs in between 1% and 4% of the general population

(Johnson, Cohen, Kasen, & Brook, 2006; Loewenstein, 1994; Şar, Tutkun, Alyanak, Bakim, & Baral, 2000). The prevalence is higher in clinical populations, with between 1% and 12% receiving a diagnosis of DID (Boon & Draijer, 1993a; Foote, Smolin, Kaplan, Legatt, & Lipschitz, 2006; Horen, Leichner, & Lawson, 1995; Kluft, 1999; Latz, Kramer, & Hughes, 1995; Ross, Anderson, Fleisher, & Norton, 1991; Şar, 2011; Saxe et al., 1993). Documentation of DID is available in many countries including Turkey, Japan, New Zealand, Australia, the USA, Canada, Argentina, the UK, Norway and the Netherlands (Dorahy et al., 2014; Kluft, 1999; Rhoades & Şar, 2005). Systematic studies in inpatient and outpatient groups show that DID is often undiagnosed in clinical settings, suggesting that misdiagnosis and failure to detect the disorder may be ongoing issues in clinical practice (Foote et al., 2006). Concerns about false positive diagnosis and a historical preference for clinicians to diagnose other disorders are theorised to have resulted in under-diagnosis being an issue (Kluft, 1985a; Kluft, 1985b). Clinicians often expect a multitude of obvious dissociative symptoms, such as observable switching, to be present in DID. When the symptoms are less marked the patient may be viewed merely as displaying "out-of-character behaviours" or as having a different psychiatric disorder entirely (Kluft, 1999). Cultural influences and unreliable diagnostic instruments can cause poor clinical judgement (Friedl, Draijer, & de Jonge, 2000) and as a result, the true DID prevalence in clinical populations may be underestimated. Conversely, research has indicated that over-diagnosis may also be a problem in DID in the form of imitated cases of patients who, partly unconsciously motivated, simulate a DID profile due to contagion or iatrogenesis. Dynamics may include the avoidance of responsibility for negative behaviour, and the compensation for an overwhelming feeling of not being seen (Draijer & Boon, 1999). Higher rates of DID appear to persist in low socioeconomic status communities (Putnam & Loewenstein, 1993), a trend similarly observed with other psychiatric disorders (Ochi, Fujiwara, Mizuki, & Kawakami,

2014). DID appears to present more in females than in males (Kluft, 1991; Putnam, Hornstein, & Peterson, 1996), likely due to higher rates of abuse and differences in coping with trauma between genders, as opposed to biological differences. In addition, females may be more likely to present to clinical settings (Reiger et al., 1988).

Etiology

The etiology of DID is contentious (Gillig, 2009; Dell, 1988), however, research supports an association between the disorder and reported traumatic events experienced in childhood, especially those of a relational nature (e.g., abuse) by someone who is relied on for care (Dalenberg et al., 2012; Dorahy, 2001; Dorahy et al., 2014; Loewenstein, 2018; Loewenstein, Frewen, & Lewis-Fernández, 2017; Nijenhuis, van der Hart, & Steele, 2010). The posttraumatic model of DID states that different identities develop as a coping mechanism response to abuse perpetrated by an attachment figure (Kluft, 1999). In these situations, children experience the contradictory feelings of being afraid of their abuser and ashamed of the events occurring, but also needing to seek comfort and safety from them (Dorahy et al., 2014; Price, 1993). Sequestering the powerful feelings and thoughts into different identities allows for this conflict to be reduced (Dorahy, 2001) when there is no possibility for the child to be protected by a secure adult (Ludwig, 1983; Price, 1993). DID development allows for the partial preservation of sense of self in the face of trauma (Loewenstein, 1994) while maintaining the attachment relationship between the adult and child. Rather than needing to continuously confront their traumatic experiences, they switch between identities who are aware of the abuse experiences and hold the feelings, memories, defences, and behaviours, and those that do not. The so-called Emotional Parts of the personality (EP) that contain memories of the abuse is thought to start to be used to deal with other life stressors (van der Hart, Nijenhuis, & Steele, 2006). The Apparently Normal Parts (ANP) of the personality, identities who are amnesic for or depersonalised from the abuse, is

considered to work to avoid trauma representations so they can complete day-to-day tasks without constant conscious intrusions about their abuse (Dalenberg et al., 2012; Nijenhuis et al., 2010; van der Hart et al., 2006). The Four-Factor Theory outlined by Kluft further conceptualises the pathways required to develop DID using a posttraumatic framework (Kluft, 1984a). (1) The child is required to have a biological predisposition to dissociation; (2) must experience traumatic experiences which result in a need for a mental defence strategy outside of those usually used by children; (3) must be living in a home and cultural environment that influences them to use this detrimental type of defence strategy; and (4) must have a lack of social support or ability to self soothe when experiencing these traumatic events (Kluft, 1984a; Rosik & Kilbourne-Young, 1999).

While the association between reported trauma and DID is well supported (see Dalenberg et al., 2012; Dorahy et al., 2014), a separate theory of DID etiology implicates social influences as having the main role in development of the disorder (Giesbrecht, Lynn, Lilienfeld, & Merckelbach, 2008; Piper & Merskey, 2004a; Piper & Merskey, 2004b; Spanos, 1994). Proponents of the sociocognitive model purport that there is a lack of evidence demonstrating a causal relationship between traumatic events in childhood and DID development, stating that the research is overly reliant on self-report data (Boysen & VanBergen, 2014; Lynn, Condon, & Colletti, 2013). This theory posits that false or exaggerated memories of trauma and dissociative identities are created by people who are highly suggestible and prone to fantasy, have poor cognitive processing and attentional capabilities, have an aberrant sleep-wake cycle, as well as those who are more easily influenced by the media or their therapists (Lynn et al., 2013; Lynn et al., 2012).

Amnesia in DID

Amnesia acts as a significant catalyst for people with DID to seek psychiatric help. Amnesia can present as the forgetting of recent and historical events that have occurred in

one's life as well as core personal information about who they are (Elzinga, Phaf, Ardon, & van Dyck, 2003; Waller et al., 1996). Studies suggest that periods of forgetting are described in 95-100% of people with DID (Boon & Draijer, 1993a; Boon & Draijer, 1993b; Coons, Bowman, & Milstein, 1988; Lewis, Yeager, Swica, Pincus, & Lewis, 1997), a figure that supports amnesia as a core DSM-5 diagnostic criterion (APA, 2013). Clinically, reports of multiple memory problems are seen in DID, illustrating the extensiveness and complexity of reported memory problems in this disorder. These include (1) forgetting of autobiographical information; (2) lack of inter-identity transfer of information; and (3) difficulties in distinguishing whether memories represent real events that have been experienced or are pseudomemories (Putnam, 1994).

People with DID report not being able to remember details for events even when there is evidence they have experienced them, or they can suddenly become conscious that they are in a place and be unable to recollect how they arrived there (Elzinga et al., 2003; Waller et al., 1996). As a result, people with DID report that they are unable to experience a continuous life narrative. By allegedly not having access to the details of their life story, they are unable to make a coherent link between their experiences of distress and the reasons for it (Kluft, 1983). Through compartmentalisation of memories into different identities, if an event occurs in one identity, another identity may not be able to recall it (Ellenberger, 1970). Reported amnesia can be one-way, where identity A is aware of the memories of identity B while identity B claims unawareness of identity A's memories, or two-way, where there is mutual reported amnesia between identities A and B (Bryant, 1995; Ellenberger, 1970). The extent and nature of amnesia can differ between identities within one person, with some experiencing a one-way amnesic relationship while others experience a two-way amnesic relationship. Additional memory impairment in DID includes a propensity to report memories

with a reduced specificity, instead presenting with an overgeneral retrieval style as a way to avoid accessing negative memories (Huntjens, Wessel, Hermans, & van Minnen, 2014).

Memory Systems and DID

The process of a memory being created involves the stages of encoding, consolidation, storage, and retrieval (Gillund & Shiffrin, 1984; Nadel & Moscovitch, 1997). When a stimulus is first presented, it enters into working memory, that involves storing, focusing attention on, and manipulating information for a relatively short period of time (Baddeley, 1992). Consolidation is the process by where the thread of the memory becomes established and associated with other experiences (Nadel & Moscovitch, 1997). Storage describes the process during which the memory is maintained so it is able to be retrieved when cued (Gillund & Shiffrin, 1984; Tulving, 1974). Most information encountered is not encoded and/or stored, and information that is encoded and stored is not always retrievable, due to processes including trace decay (Ricker, Vergauwe, & Cowan, 2016) and childhood amnesia (Bauer, 2015; Peterson, Hallett, & Compton-Gillingham, 2018). In addition to clinical observations of DID patients experiencing deficits in remembering autobiographical details, reports of amnesia have expanded to amnesia for procedural, semantic and episodic memories. The procedural memory system is used to access information about the actions required to complete tasks (e.g., driving a car and riding a bike). The semantic memory system is associated with knowledge about the world around us while the episodic memory system holds information about personally experienced events (Tulving, 1985). Held within episodic memories is information regarding a person's perspective on temporal and spatial details of the event and the order in which these events were experienced (Conway, 2009). There is also an ability to clearly remember the events happening through access to the details of what occurred at the time of experiencing (e.g., what a person was thinking, what else occurred on that day; Tulving, 1985). Memories encoded into these systems have a

corresponding level of consciousness attached to them. A memory retrieved from the procedural system is drawn with anoetic (non-knowing) consciousness which involves an ability to unconsciously perceive and respond to stimuli (Tulving, 1985). A memory retrieved from the semantic memory system is drawn with noetic (knowing) consciousness which involves consciously perceiving stimuli so that it is known to be true. A memory retrieved from the episodic memory system is drawn with autonoetic consciousness, which involves being able to access details of the time and place that the event occurred, as well as a feeling that it was the person themselves who experienced it. Implicit memory retrieval refers to memories of past experiences influencing a person's behaviour without any awareness of remembering (Dorahy & Huntjens, 2007; Schacter, Chui, & Ochsner, 1993). Explicit memory retrieval involves accessing information where the person is aware that they experienced that which is being retrieved (Kihlstrom, 1998).

The extent of memory transfer in DID has been debated, with initial research presenting different conclusions about which types of memories are able to transfer across amnesic barriers. For identities where two-way amnesia exists, as a result of the subjective reports of amnesia, it was initially concluded that no transfer would occur. However, when attempts were made to compare memories retrieved implicitly with those retrieved explicitly, researchers observed that although explicitly retrieved memories remained amnesic, certain implicitly retrieved memories exhibited transfer. Nissen, Ross, Willingham, Mackenzie and Schacter (1988) and Eich, Macauley, Loewenstein and Dihle (1997) found that when memories were assessed via contextual- and data-driven tasks that relied upon implicit retrieval, only the data-driven stimuli exhibited transfer. Such results provided support for the idea that context-driven stimuli remain compartmentalised in identities, while data-driven, perceptual information was not compartmentalised. Context-driven information requires meaning to be applied in order for it to be understood and fully

processed (Dorahy, 2001; Eich et al., 1997; Nissen et al., 1988), for example, a photo of the church that a person with DID was married in will have a different meaning for identities who have knowledge of the marriage compared to those identities who are unaware they are married. Moreover, even if both amnesic identities are aware of the marriage, they may have experienced different events associated with it, which may have resulted in a different emotional context to be applied to their marriage (e.g., one identity may have access to happy memories while another may have access to memories of abuse at the hands of their partner). On the contrary, data-driven information has essentially the same meaning in any context (Nissen et al., 1988), for example, that the sky is blue is a fact which will have the same meaning to numerous identities. This distinction was further supported by Peters, Uyterlinde, Consemulder and van der Hart (1998) who also found evidence of the transfer of data-driven information via implicit retrieval tasks.

More recent research using larger sample sizes and more sophisticated experimental techniques has failed to find evidence of amnesia for both implicitly and explicitly retrieved data in DID, with both data-driven and contextually-driven semantic memory, as well as procedural memory exhibiting transfer (Allen & Movius, 2000; Elzinga et al., 2003; Huntjens et al., 2005; Huntjens, Peters, Woertman, van der Hart, & Postma, 2007; Huntjens, Huntjens, Postma, Hanmaker, Woertman, & van der Hart, 2002; Huntjens, Postma, Peters, Woertman, & van der Hart, 2003; Huntjens, Postma, Woertman, van der Hart, & Peters, 2005; Kong, Allen, & Glisky, 2008; Peters et al., 1998). Researchers have used a variety of different tools to assess memory transfer in people with DID and non-clinical controls. Elzinga et al. (2003) found intact memory transfer for both data- and context-driven stimuli measured via implicit retrieval tasks. Allen and Movius (2000) compared event-related potentials (ERPs) to determine whether physiological measures would show evidence to support amnesia for explicitly retrieved memories.

Although the DID group claimed to have no memory of the words presented in identity A, their ERP profile was indistinguishable from control participants simulating the disorder. Additionally, Huntjens et al. (2003) assessed the transfer of episodic memory across identities with the use of an interference paradigm. DID participants were asked to take part in tasks in one identity (Identity A) and were then tested for memory transfer in an "amnesic" identity (Identity B). Results indicated evidence of the transfer of episodic memory across the amnesic identities, a finding replicated by Kong et al. (2008), paying special attention to the mitigation of implicit memory effects.

The field has also aimed to address whether emotional valence may have a role in which information transfers across identities, based on clinical observations and theoretical conjecture that painful experiences give rise to distinct identities as a means of coping (Peters et al., 1998). For example, as EP's tend to report the memories of traumatic events while ANP's appear to be amnesic for them, it has been hypothesised that stimuli with negative, traumatic connotations may stay compartmentalised in EP's. Elzinga et al. (2003) compared performance for emotional and neutral words to find that implicit memory retrieval was intact in identities retrieving both types of stimuli. Huntjens et al. (2005) also concluded that memory for newly acquired stimulus valence transferred across DID identities subjectively reporting amnesia when measured using tests of implicit retrieval. Huntjens and colleagues (2007) objectively tested recall and recognition for emotionally valenced material learned in another identity in an amnesic identity. The results indicated no evidence of total inter-identity amnesia for emotionally valenced material in DID.

In sum, despite subjective reports of amnesia, research using objective measures has consistently yielded evidence of extensive memory transfer when accessed through implicit and explicit retrieval (Allen & Movius, 2000; Bryant, 1995; Huntjens et al., 2005;

Huntjens et al., 2007; Huntjens, 2002; Huntjens et al., 2003; Huntjens, Postma et al., 2005; Kong et al., 2008).

Semantic Autobiographical Memory Impairment in DID

Research has attempted to address whether stimuli associated with autobiographical details also exhibits transfer. The autobiographical memory system is associated with a person's own experiences and includes knowledge about who a person is (i.e., their beliefs about their self) and the events that have occurred in their life that confirm these beliefs (Conway & Pleydell-Pearce, 2000*).* Although a criterion of DID is amnesia for personal information (APA, 2013), research has so far failed to find support for these amnesic barriers. Huntjens, Verschuere and McNally (2012) used a concealed information task to assess for transfer of autobiographical stimuli encoded (mainly) into the semantic memory system across amnesic identities. Participants presented no difference in ability to recognise autobiographical information of the tested identity compared with other, amnesic identities. As a result, autobiographical memories encoded into the semantic memory system were concluded to show no amnesia when tested via objective measures.

Episodic Autobiographical Memory Impairment in DID

Research has attempted to address the transfer of memories in semantic and episodic form, however, episodic autobiographical memory is less understood. In DID, these can be memories that some identities find distressing due to their association with abuse and trauma. The continuation of compartmentalised identities in DID appears to be maintained by keeping these experiences impervious to inter-identity transfer, despite evidence that identities can be influenced by emotional stimuli implicitly.

Conway and Pleydell-Pearce (2000) state that autobiographical memories are created from a knowledge base of self-referential information that is accessed in the presence of certain cues. This knowledge base is made up of information associated with one's self-concept, including

previous experiences, who they are as a person and future goals. People tend to remember and retrieve information that confirms their beliefs about themselves, others and the world around them. A person's self-concept can determine which details are encoded and then retrieved from an event (Conway & Pleydell-Pearce, 2000). This process can be hypothesised to explain why expected cues do not lead to the memories of certain events being retrieved, a phenomenon widely reported in people with DID. For an ANP, dealing with trauma is not in line with maintaining their sense of self as someone who does not experience abuse. When a cue associated with trauma is presented, it may be less likely they will report a traumatic memory compared to an EP.

Autobiographical memories include a self-referential characteristic in that they allow people to reflect on instances where they have successfully achieved their goals (Conway & Pleydell-Pearce, 2000). Through recollection of these types of events, people are able to alter their goals in a way that will ensure future success, increasing their self-esteem and reported life satisfaction (Judge, Bono, Erez, & Locke, 2005). In DID, although one identity may have a goal of proceeding successfully through daily life, another may exist to deal with stressful life events. As the DID criteria are primarily associated with separated identities who claim to have distinct life goals, the importance of understanding the extent of impairment in the autobiographical memory system is of central importance.

Aim and Outline of the Thesis

Although research has been conducted exploring amnesia for episodic, semantic and procedural memory in DID, methods investigating episodic autobiographical memory have yet to be considered. The main question this thesis considers was whether episodic autobiographical memory exhibited transfer across identities that report amnesia, in line with the previous research assessing transfer of other memory system stimuli. The autonoetic or noetic quality of any transferred autobiographical episodic stimuli was also assessed. The

majority of the studies included in this thesis have involved a group instructed to simulate DID in order to address concerns from sociocognitive model proponents that participants with DID may be simulating amnesia. Two additional comparison groups of healthy participants were also included, one that was "amnesic" for the second identities information and one that was "nonamnesic" for this information.

Chapter two examines episodic memory transfer for self-referential information accessed explicitly. Recall and recognition tests were used to assess memory performance in the identity that experienced the information, as well as in an identity that reported amnesia. Identities were also assessed for deficits in the stages of self-awareness via Tulving's "remember/know" paradigm, where "remember" responses indicate that memory exists at autonoetic consciousness and "know" responses indicate noetic consciousness. In Chapter three, episodic autobiographical memory transfer for events manipulated in the laboratory was assessed. The recall and forced choice recognition tasks and the remember/know paradigm used in Chapter two, were employed to assess for differences in explicit memory retrieval and the remember or know quality of the memory. Chapter four used a more implicit measure to assess the extent of episodic memory transfer for self-referential information. The autobiographical Implicit Association Test (aIAT) was used to determine whether more objective tests would also provide comparable results to those presented in Chapters two and three. In Chapter five, the ability for identities to engage in meaning-making of self-defining memories was assessed, a process associated with developing an integrated sense of self. In Chapter six, a discussion of the outcomes of the results is presented.

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Chapter 2

Inter-Identity amnesia for episodic, self-referential memory in Dissociative Identity Disorder

Amnesia is one of the core diagnostic criteria for Dissociative Identity Disorder (DID). In this experiment, a vignette task was used to assess the extent of amnesia for episodic, self-referential memories across identities. Nineteen DID participants, 16 DID simulators, 21 amnesic, and 20 non-amnesic comparison participants from the general population were recruited. They were presented with two vignettes (DID and simulator participants received one in each of the identities) and asked to imagine themselves in the situations outlined. Tasks assessing free recall and recognition for the stimuli were utilised. Subjectively, all DID participants reported amnesia for vignettes encoded in the other identity. On measures of explicit retrieval, DID participants indicated inter-identity amnesia on tests of recognition and a trend for amnesia on tests of recall. However, both amnesic comparisons and simulators instructed to feign amnesia showed comparable performance to patients with DID. This hinders unequivocal interpretation of results. In conclusion, the results provided mixed corroboration for the thesis of inter-identity amnesia.

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Inter-Identity amnesia for episodic, self-referential memory in Dissociative Identity Disorder

Dissociative Identity Disorder (DID) is regarded as the most extreme of the dissociative disorders. It involves a person reporting the existence of at least two separate identities that consistently take control of their thoughts and behaviour (American Psychiatric Association [APA], 2013). Amnesia for experienced events and personal information is a core diagnostic criteria for DID, and can present as two-way (with no transfer of information reported across identities) or one-way (with only one identity reporting access the memories of the other; Ellenberger, 1970; Bryant, 1995). It is not uncommon for adults with DID to present with identities who claim to have full awareness of traumatic experiences from the past, and others that report little or no recall of previous traumatic events (Kluft, 2007; Van der Hart, Nijenhuis, & Steele, 2006).

Not yet understood is the extent to which amnesia exists in DID. Preliminary research suggested that only memories retrieved explicitly exhibited inter-identity impairment (Nissen, Ross, Willingham, Mackenzie, & Schacter, 1988; Eich, Macauley, Loewenstein, & Dihle, 1997); however, studies using more objective measures have found both explicitly and implicitly retrieved memories in DID to exhibit transfer. It is also evident that although amnesia for stimuli with traumatic and non-traumatic connotations is subjectively reported, both of these types of memory exhibit transfer when assessed via objective measures (Allen & Movius, 2000; Elzinga, Phaf, Ardon, & Van Dyck., 2003; Huntjens et al., 2005; Huntjens, Peters, Woertman, Van der Hart, & Postma, 2007; Huntjens, Postma, Hanmaker, Woertman, & van der Hart, 2002; Huntjens, Postma, Peters, Woertman, & Van der Hart, 2003; Huntjens, Postma, Woertman, Van der Hart, & Peters, 2005; Huntjens, Verschuere, & McNally, 2012; Kong, Allen, & Glisky, 2008; Peters, Uyterlinde, Consemulder, & Van der Hart, 1998). Although previous research has begun to explore the profile of transfer of episodic memory

(Huntjens et al., 2003; Huntjens et al., 2005), research has not yet assessed whether self-referential material also exhibits a similar memory transfer pattern as non-self-referential material. As DID is a disorder associated with disruptions of sense of self this material should be a point of focus for DID research. In the current study, we aimed to determine whether the reported impairment in memory transfer across amnesic identities was evident for episodic, self-referential information. The episodic memory system holds information about experienced events. When retrieved these memories are paired with a feeling of being able to recollect and re-experience the event, alongside an ability to identify that this is an experience that fits in with the story of the self over time (autonoetic consciousness; Tulving, 1972). If a memory does not elicit autonoetic consciousness, it is retrieved from the semantic memory system, without the rich recollective experience (noetic consciousness; Tulving, 1972). These types of consciousness during retrieval can be accessed in the remember/know paradigm, in which people are asked to remember an experienced event as having occurred (autonoetic consciousness) or simply know that the event has occurred (noetic consciousness). This paradigm was previously used in DID research by Huntjens and colleagues (2003). Although Huntjens et al. (2003) found no differences for information being retrieved with autonoetic or noetic consciousness for amnesic identities, the study did not utilise self-referential stimuli which may have resulted in more limited access to autonoetic consciousness. In the current study, a free recall and forced choice recognition task were used to assess explicit memory retrieval for self-referential stimuli. The forced choice recognition task also included a remember/know paradigm to assess whether the memories were accessed via noetic and autonoetic consciousness depending on their experienced identity.

To assess the extent of amnesia, several comparison samples were included. We recruited two non-clinical comparison groups, one that showed no amnesia and a second group that was truly amnesic for the self-referential material assessed. We also included a

group of people instructed to consciously simulate DID for the following reason. The association between reported trauma and DID is well supported. Yet, a separate theory implicates social influences as the main factor in development of the disorder (Piper & Merskey, 2004a; Piper & Merskey, 2004b; Spanos, 1994). Rather than people with DID developing identities to avoid the constant reliving of chronic trauma, the sociocognitive model states that people with DID are instead highly suggestible, prone to fantasy, and influenced to (consciously or unconsciously) role-play multiple identities by their therapists and other cultural factors (Lynn, Condon, & Colletti, 2013; Lynn et al., 2014; Spanos, 1994). Due to the sociocognitive theory implicating the feigning of symptoms in the development of DID, a group of people consciously simulating DID were included in the current study. Thus participants in the study were from four samples: 1) DID participants reporting two-way amnesia, 2) simulator participants educated on how to mimic DID, 3) non-clinical comparison participants given stimuli shown to one identity (i.e., half of the stimuli; amnesic group) and 4) non-clinical comparison participants given stimuli shown to both identities (i.e., all of the stimuli; nonamnesic group).

To ensure control of demographic characteristics, the DID participants were matched as close as possible in terms of age and gender to simulators and comparison participants from the general population. Based on the research presented in Chapter one, the current study tested the following four hypotheses: (1) For free recall, DID participants would exhibit amnesia (i.e., scores not above distractor performance) of vignettes encoded in a different identity, a similar profile to the amnesic non-clinical comparison group. Non-amnesic comparison participants will exhibit comparable memory retrieval for both vignettes; (2) For forced choice recognition, a similar pattern of results was predicted (3) For remember and know responses, DID participants would exhibit relatively higher remember scores for vignettes encoded in the same identity and relatively higher know scores for vignettes

encoded in the other identity, comparable to amnesic comparison participants. Non-amnesic participants would exhibit comparable remember-know scores across vignettes.

Method

Participants

DID sample. Nineteen DID participants were recruited from referrals via clinicians or from a dedicated hospital-based programme in Australia. The target sample size was 20, a number based on pre-existing studies of inter-identity transfer (e.g., Huntjens et al., 2003). Clinicians referring to the hospital, or those known to work with DID patients, were sent information on the study and invitation letters to pass on to DID patients they felt were stable enough to receive the information. Nurses at the hospital also gave the invitation letter to DID patients attending hospital programmes. Inclusion criteria were, (1) a pre-existing DID diagnosis; (2) a confirmation of the DID diagnosis via the Dissociative Disorders Interview Schedule (DDIS) administered by the primary researcher; (3) the capacity to engage two identities who report a lack of knowledge for events that occur in the other identity; (4) one participating identity having more awareness of distressing events from the past and the other participating identity having less awareness of such events[1], and (5) the ability to switch between these two identities on request. Participants were excluded if they (1) were too impaired by their psychiatric state to concentrate on the computer tasks, (2) were unable to switch between identities or retain an identity in executive control, or (3) reported no amnesia between participating identities. Participants were told that the study would examine memory in different identities in a DID sample. Participants self-selected the two identities (labelled A

[1] This was to reflect a different emotional make-up in each identity, which has been used in other studies (Huntjens et al., 2012; Reinders, Willemsen, den Boer, Vos, Veltman, & Loewenstein, 2014).

and B) that took part in the study and received a $20 shopping voucher for participating. Of the 19 DID participants tested, seven were removed for: failing to complete the task (n = 1), being unable to switch between identities (n = 3), or experiencing test interference from a third identity (n = 3). The final DID sample contained 12 participants[2].

Comparison samples. Forty-one comparison participants took part in the study (i.e., the target number in each group was 20 in order to match the DID sample number). These were: members of the general population of Christchurch and Brisbane recruited by snowball sampling (n = 26) selected to match the mean age and gender of DID participants, and undergraduate psychology students (n = 15) recruited via a participant research pool or advertisements placed around a psychology department. The advertisement stated that volunteers were sought to participate in a psychological experiment assessing memory abilities in different groups of people. Comparison participants reported no memory or attentional deficits as asked by the researcher. They were randomly assigned to an 'amnesic' group or a 'nonamnesic' group. Participants in the amnesic group received the memory stimuli presented to identity A in the DID group (see procedure), while participants in the nonamnesic group received both the memory stimuli given to DID identity A and to identity B. Comparison participants were not aware that the study was researching DID. Participants received $20 in shopping vouchers for participating in the research.

Simulator sample. Sixteen DID simulator participants took part in the study. The target sample size was 20 to match the patient sample number, but unfortunately timing constraints and personnel changes in the research team limited recruitment of this group. Participant were professional and amateur actors from a University Theatre and Film

[2] Two patients were not administered the DDIS due to an administration error. All 10 participants who were administered the DDIS had their diagnosis confirmed.

Department, and various theatre companies from around Christchurch, New Zealand. They were selected to match the mean age of DID participants. They developed two identities that they were instructed should have amnesia between them, and followed the same protocol as the DID sample (see procedure). Of the sixteen simulator participants tested, two were removed (both were female) for refusing to complete the full test session. Participants received $20 in shopping vouchers for taking part, along with an added incentive of $50 for the participant who best simulated DID (as rated by the primary researcher using a post-experiment questionnaire; details provided in materials section). The final simulator sample contained 14 participants.

Table 1 displays the demographic details for each sample. The groups differed significantly for age, $F(3, 63) = 3.46$, $p = .021$, $\eta_p^2 = .141$, with simulators presenting significantly younger ages than amnesic comparisons ($p = .031$). DID participants did not differ significantly from simulators ($p < .078$), amnesic ($p = 1.000$) or nonamnesic comparisons ($p = 1.000$). Simulators showed a trend to differ from nonamnesic comparisons ($p = .059$), but did not differ from the amnesic comparisons ($p = 1.000$). There were minimal variations in gender, but due to the low count for males across groups, inferential statistics were not conducted. Comparative analysis was also not utilised for ethnicity and education due to cells with low counts.

Table 1

Participant Demographic Data across Groups

	DID (n = 12)	Simulator (n = 14)	Amnesic Comparison (n = 21)	Nonamnesic Comparison (n = 20)
Age *M (SD)*	39.17 (3.39)	28.86 (3.85)	39.10 (1.90)	38.35 (1.62)
Sex *n* (%)				
Male	0 (0%)	2 (14.3%)	1 (4.8%)	1 (5%)
Female	12 (100%)	12 (85.7%)	20 (95.2%)	19 (95%)

Ethnicity*				
New Zealand European	0 (0%)	12 (85.7%)	11 (52.4%)	16 (80%)
Māori	0 (0%)	0 (0%)	0 (0%)	0 (0%)
Australian European	10 (83.3%)	2 (14.3%)	1 (4.76%)	0 (0%)
European Other	3 (25%)	1 (7.14%)	5 (23.8%)	0 (0%)
Other	1 (8.3%)	0 (0%)	5 (23.8%)	4 (20%)
Qualification§				
High school certificate	4 (33.3%)	7 (50%)	2 (9.5%)	2 (10%)
Post-high school non-university (e.g. Trade certificate)	1 (8.3%)	0 (0%)	8 (38.1%)	7 (35%)
University Level	5 (41.7%)	7 (50%)	11 (52.4%)	11 (55%)

* For the dissociative identity disorder (DID) group, two participants chose two ethnicities. For the simulator group, one participant chose two ethnicities. For the amnesic comparison group, one participant chose two ethnicities. For the nonamnesic comparison group, one participant chose two ethnicities, and one participant did not indicate an ethnicity. § For the DID group, two participants reported no qualifications.

Materials

All participants completed a vignette memory task and a questionnaire battery.

Vignettes. Two vignettes were developed for the study. These vignettes expanded on previous work that has used stories to create memories in a laboratory context with clinical and non-clinical participants (Dorahy et al., 2017). Use of vignettes allows the exact memorised experience to be measured across identities. The topics of the two vignettes focused on being at home and in a park. For the current study, these two vignettes had neutral emotional content. The home story involved participants surfing the internet and telling a friend about clothing specials they had found. The park story involved participants walking around a park, feeding the ducks and it starting to rain. Both vignettes were 14 sentences

long. Vignettes can be viewed in full in Appendix E-2. Francis and Kucera's (1982) word frequency in the English language list was used to confirm that vignette task words did not differ significantly in their frequency, $t(14)$ -1.88, $p = .081$, (see Table 2).

Table 2

Word Frequency Means (with SD) for Vignettes

Vignette task	Word frequency
Home	1110.53 (1451.69)
Park	2340.73 (2143.85)

Questionnaires. All participants completed the Dissociative Experiences Scale (DES), the PTSD Symptom Scale - Self-Report (PSS-SR) and a demographic questionnaire. DID and simulator participants were also administered the Dissociative Disorders Interview Schedule (DDIS). The interviewer completed a Post-Experiment Questionnaire. All questionnaires can be found in Appendix D.

DES (Carlson & Putnam, 1993). The DES is a self-report measure assessing the presence of general dissociative experiences and symptoms over 28 items (Carlson & Putnam, 1993) (see Appendix D-2). Participants indicate the percentage of time they experience each dissociative item when not under the influence of alcohol and drugs using an eleven point scale ranging from 0 (never) to 100 (always). A mean is calculated, with scores ranging from 0 to 100. The DES was included as a measure of current pathological and non-pathological dissociative experiences. It is appropriate for assessing dissociative experiences across the participant groups used in this experiment (i.e., participants with a dissociative diagnosis and non-clinical comparisons).

The DES has excellent psychometric properties and has been used in clinical populations with and without dissociative diagnoses and also non-clinical populations (Bernstein Carlson et al., 1993; Brand, Classen, McNary, & Zaveri, 2009; Carlson & Putnam, 1993; Dell, 2002; Kennedy et al., 2004; Lipsanen, Saarijarvi, & Lauerma, 2003; Perona-

Garcelán et al., 2012; Tsar, Kundakci, Kiziltan, Bakim, & Bozkurt, 2001). Table 3 shows the alphas for each sample in the current study.

PSS-SR (Foa, Riggs, Dancu, & Rothbaum, 1993). The PSS-SR (see Appendix D-3) was included to assess for the presence of PTSD symptoms. Research suggests that DID is often comorbid with PTSD (Boon & Draijer, 1993; Vermetten, Schmahl, Lindner, Lowenstein, & Bremner, 2006). The PSS-SR is a diagnostic 17-item self-report measure which assesses for the presence and severity of PTSD symptoms in those known to have experienced traumatic events on a scale ranging from 0 (not at all) to 3 (five or more times per week/very much/almost always) (Foa et al., 1993). The PSS-SR has good psychometric properties (Foa et al., 1993). Table 3 shows the alphas for each sample in this study.

Table 3

Cronbach's alphas for DES and PSS-SR by Group

Group	DES	PSS-SR
DID (n = 12)	.87	.88
Simulator (n = 14)	.96	.89
Amnesic Comparison (n = 21)	.88	.90
Nonamnesic Comparison (n = 20)	.99	.93

Demographic Questionnaire. The demographic questionnaire was constructed of questions about participant age, gender, ethnicity and education level (see Appendix D-4). It was included to match simulator and comparison controls to the participants with DID, on these measures.

DDIS (Ross et al., 1989). The DDIS is a structured interview used as a diagnostic tool to assess for dissociative disorders. The DID section of the measure was used to make an

independent, structured clinical interview diagnosis of DID, a method previously used in Dorahy, Middleton and Irwin (2005) and Dorahy, McCusker, Loewenstein, Colbert and Mulholland (2006) (see Appendix D-1). Respondents are asked to answer questions relating to whether they have felt they had distinct identities, whether these take control of their behaviour, whether they experience an inability to recall important personal information and whether these issues are due to substance abuse. The DDIS is a psychometrically sound measure assessing the presence of dissociative disorders (Ross et al., 1989). Interrater reliability indicates substantial agreement across clinicians, with a reported kappa value of 0.68 (Ross et al., 1989).

Vignette Task Emotion Ratings. Directly after each vignette was administered, participants were asked to rate their emotional reaction to the information. They were asked to respond on a questionnaire rating the extent to which they felt shame, disgust, anxiety, embarrassment, guilt (compiled into an overall negative emotion score) and happiness along a 0 (not at all) to 100 (completely) 11 point Likert scale (Appendix D-5). The emotion ratings were included to ensure that one vignette was not more salient due to an increase in emotional tone.

Post-experiment Questionnaire. The primary researcher was blind to whether DID and simulator participants truly had DID or were feigning it as a simulator. Consequently, a post-interview questionnaire was included for the primary researcher to state whether DID and simulator participants appeared to present with features of DID. The researcher was asked whether the participants appeared to have distinct identities and in what ways their appearance differed. The researcher was also asked whether there appeared to be amnesia between the identities and whether the person appeared to have DID. This assessment was included to determine if the simulators could successfully mimic DID (i.e., have the

researcher believe they had the disorder). The post-experiment questionnaire can be found in Appendix D-7.

Experimental Measures.

Free Recall (FR).

FRImmediate. Immediately after hearing each vignette, participants were given two minutes to state all the details they could remember. Participants were prompted following their retrieval effort with the questions "are those all the details that you can remember?" and "does anything else come to mind?" The FRImmediate acted as a memory consolidation task.

FRDelayed. Once all vignettes had been administered, participants were asked to state the details of the two vignettes. Participants were prompted with, "are those all the details you have about that story". Following their recall of the first vignette, if they did not spontaneously recall the other vignettes (e.g., DID participants, simulators, amnesic comparisons), the participants were prompted with "did you hear any other stories?" An affirmative response brought an invitation to outline that story. A negative response resulted in the research administering an additional prompt of: "do you remember anything about being in your house?" or "do you remember anything about a park?" If the response was negative, the researcher administered an additional prompt of: "do you remember anything about being on your computer?" or "do you remember anything about feeding ducks?" These prompts were designed to assess if DID and simulator participants could volunteer and explicitly retrieve information given to their amnesic identity. The FRDelayed occurred after 35 (amnesic comparisons) to 60 minutes (DID participants, simulators, nonamnesic comparisons) from the presentation of the FRImmediate. Previous research has indicated little outcome differences in memory recall due to time delays with this variability (Degenszajn, Caramelli, Caixeta, & Nitrini, 2001). The FRDelayed assessed free recall memory of the vignettes and acted as a marker of explicit retrieval interference to assess if

one vignette's details were present in another story and if the DID and simulator participants could explicitly retrieve information given to their 'amnesic' identity.

Forced Choice Recognition.

Stimuli Recognition. Participants were presented with 38 sentences individually placed in the middle of a computer screen. Half of these (i.e., ten and nine sentences) were related to each neutral vignette (19 in total), and 19 were not related to either vignette (distractor stimuli) (Appendix E-9). Distractor stimuli were matched to the vignette related stimuli based on word category (i.e., noun, verb). Participants indicated whether they recognised the sentences as representing details that had happened in the stories by pressing the Y key on the keyboard, or if they did not recognise them, by pressing the N key. Order of presentation of the stimuli was randomised across each participant. The forced choice recognition task was used to assess recognition memory of the vignettes. It was administered between 40 minutes (amnesic comparisons) and 65 minutes (DID participants, simulators, nonamnesic comparisons) after each participant got exposed to the second and final vignette (for DID participants and simulators, this was identity B).

Remember/know. If participants indicated that they recognised the sentence as representing a detail from the vignettes, they were asked to state whether they 'remembered' or 'knew' that it had happened. A 'remember' response was explained to participants as being paired with an actual recollection of the event, while a 'know' response was explained as being paired with only a feeling that the event happened. For example, the memory of going to the cinema would be classified as a 'remember' response if the person was able to remember visual, auditory or tactile details of the event (what the movie was, whether they were alone or with others, where they sat in the cinema, what went through their mind at the time). The event would be classified as a 'know' response if the participant could not recall any details about the experience, but felt it had happened (i.e., they sensed they had been to

the cinema). Participants pressed the R key on the computer keyboard to indicate 'remember', and the K key to indicate 'know'. This task was included to assess autonoetic and noetic memory retrieval.

Procedure

The study was part of a larger experiment on memory transfer in DID requiring written informed consent from all participants. Measures unconnected to the present study included free recall and forced choice recognition tasks assessing inter-identity transfer of episodic, autobiographical memories, and an implicit association test of episodic, self-referential memory transfer. This study was approved by both the University and Hospital Research Ethics Committees.

Simulator training phase. First, participants rated their knowledge of DID from very knowledgeable to no knowledge (Appendix C-1) and indicated whether they had any visual, memory or attentional impairments. Participants were then shown a video describing DID which provided information to aid simulator performance. The video was 8.27 minutes long and consisted of clips from two documentaries "Multiple Personality Disorder: The Search for Deadly Memories" (Moss, Nevins, & Mierendorf, 1993), and the trailer of "When the Devil Knocks" (Harper, Palmer, & Slinger, 2010). Both clips presented people with DID, information about how and why it can develop, and the course of therapy. A Dissociative Identity Disorder Information Sheet was also provided and consisted of three pages of information outlining the DSM-5 diagnostic criteria of DID and answers to frequently asked questions (e.g., do people actually have multiple personalities, how do the identities develop, is it obvious when a person switches personalities, what are the symptoms of DID, is DID a major health problem and can dissociative disorders be cured?) (Appendix C-2). The information sheet was adapted from one provided by the Sidran Foundation. An Identity/Character Description Sheet was also administered to simulators which required

participants to complete 18 questions about their created identity. Participants were given education on how to mimic DID which included practice instructions on how to create and switch between identities. They were provided with a checklist of 18 characteristics of their simulated identities that needed to be addressed. Participants in this group were told to convince the researcher who was conducting the assessment session, and who was blinded to their simulator status, that they had a DID diagnosis and experienced amnesia between identities. They were given one-to-two weeks to practice to cultivate their dissociative identity before testing.

Experimental Procedure.

The study was separated into five phases: (1) questionnaire battery completion, (2) vignette task presentation and initial free recall, (3) delayed free recall (4) forced choice recognition task and (5) post-experiment questionnaire completion.

Phase 1. All participants signed a written informed consent form (Appendix B-7). After consent, the primary researcher administered the DDIS. Participants then completed their demographic information and the DES and PSS-SR using the Qualtrics survey platform. The order of the latter three questionnaires was randomised.

Phase 2. Participants completed the vignette task where they listened to one or two vignettes, depending on their group allocation. The order of vignette set presentation was counterbalanced across participants[3].

- DID and simulator participants listened to one vignette in identity A and then switched to their "amnesic" identity (identity B) where they listened to a second vignette.
- Amnesic comparisons listened to only one vignette.
- Nonamnesic comparisons listened to two vignettes.

Participants were told to remember as many details as possible and become absorbed in the stories. The vignettes were played through headphones and after each sentence, participants were asked to repeat aloud what had been said, changing from second to first-person perspective (e.g., heard, 'you are in your house', repeated, 'I am in my house'). This step was included to increase the self-referential quality of each story (Dorahy et al., 2017). After each participant had finished repeating the sentence, the next sentence was presented. After each vignette, the immediate free recall task was administered. Participants were then required to complete the vignette emotion ratings questionnaire. Once the first vignette had been concluded, DID and simulator participants were asked to switch into their second

[3] Eight of the final DID sample received the house vignette in identity A, and four received the park vignette in identity A. Eight of the final simulator sample received the house vignette in identity A, and six received the park vignette in identity A. Eleven amnesic comparisons received the house vignette in identity A and ten received the park vignette in identity A. Ten nonamnesic comparisons received the house vignette in identity A and ten received the park vignette in identity A.

identity and were administered the second vignette. Nonamnesic comparisons were presented with the second vignette after receiving the first.

Phase 3. After an interval of 35-60 minutes in which other tasks unrelated to the present one were presented, the participants were asked to recall all the details they could remember from the first vignette they heard (i.e., delayed recall). DID and simulator participants were assessed in the same identity that heard the first vignette. They were then asked to recall information from any other vignettes they heard.

Phase 4. Participants were required to complete a forced choice recognition task, in which they had to state whether they recognised sentences presented on a computer screen as representing events that had happened in the vignettes. If they responded that sentences did represent the vignettes, participants were required to state whether they "remembered" or "knew" that these had happened. DID and simulators were tested in Identity A.

Phase 5. The primary researcher completed the post-experiment questionnaire for DID and simulator participants.

Data Analysis

Recall. Two stimuli from the park vignette were removed from the recall analysis due to them being rated as too similar to other items. The number of words accurately recalled from each vignette was compared. Identity A vignettes were contrasted with identity B vignettes. The proportion of correct stimuli (correct stimuli divided by the total number of vignette stimuli) was calculated.

Recognition. One stimulus from the park vignette was removed from the recognition sentences for data analysis due to it being rated as too similar to other stimuli upon closer inspection. Recognition hit rates were calculated for each vignette (correct stimuli divided by the total number of vignette stimuli). False alarms, sensitivity and response bias for each vignette were also calculated. Sensitivity and response bias were calculated using z-score

procedures outlined in MacMillan and Creelman (2005) to gain *d'* and c. *d'* was used to convey sensitivity and calculate the proportion of stimuli presented to the participants that were coded as being previously seen (hits), while correcting for distractor stimuli that were incorrectly coded as being previously seen (false alarms) (*d'* = z(H) – z(F)). Response bias (c) is conveyed as a participant's likelihood to respond yes or no to stimuli as having previously been seen and is represented using the midpoint between z(F) and z(H) (c = - [z(H) + Z(F)]/2). A higher response bias indicates that participants were more conservative (i.e., less inclined to recognise items as old).

Remember/know. A remember/know rate was calculated for each vignette dividing information classified as remembered or known by participants hit stimuli.

Results

Questionnaires

Dissociative experiences differed significantly across groups, $F(3, 63) = 57.95$, $p < .001$, $\eta_p^2 = .734$. DID participants ($M = 61.16$, $SE = 13.02$) scored significantly higher than simulators ($M = 44.16$, $SE = 21.31$; $p = .007$), amnesic comparisons ($M = 11.34$, SE = 7.77; $p < .001$) and nonamnesic comparisons ($M = 10.89$, $SE = 8.39$; $p < .001$). Simulators also presented a significantly higher score than amnesic ($p < .001$) and nonamnesic ($p < .001$) comparisons. Comparison participants did not show a significant difference ($p = 1.000$).

PTSD symptoms differed significantly across groups, $F(3, 63) = 42.94$, $p < .001$, $\eta_p^2 = .67$. DID participants ($M = 42.67$, $SE = 9.19$) reported higher scores than simulators ($M = 21.93$, $SE = 10.06$; $p < .001$), amnesic comparisons ($M = 7.19$, $SE = 7.012$; $p < .001$) and nonamnesic comparisons ($M = 11.30$, $SE = 10.48$; $p < .001$). Simulators also presented a significantly higher score than amnesic ($p < .001$) and nonamnesic ($p = .009$) comparisons. Comparison participants did not show a significant difference ($p = .631$.).

Vignette Emotion Ratings

Vignette emotion ratings are reported in Table 4. A mixed measures ANOVA on Vignette (home vignette, park vignette) by Group (DID, simulator, nonamnesic comparison) was conducted. As the amnesic comparisons received only one vignette they were not included in the analysis. The home and park vignettes did not differ significantly on ratings of happiness, $F(1, 43) = .02$, $p = .876$, $\eta_p^2 = .00$, or negative emotion, $F(1, 43) = 2.50$, $p = .121$, $\eta_p^2 = .06$. There were also no differences in groups for happiness $F(2, 43) = .58$, $p = .564$, $\eta_p^2 = .03$; however the groups did differ significantly for negative emotion, $F(2, 43) = 19.82$, $p < .001$, $\eta_p^2 = .48$. DID participants rated both vignettes as significantly more negative than both simulators ($p < .001$) and nonamnesic comparisons ($p < .001$). Simulators did not differ significantly from the nonamnesic comparisons ($p = .545$). There was no significant difference in DID participants rating of each vignette $t(11) = -.96$, $p = .356$, indicating that each vignette was rated as having the same emotional connotations.

Table 4

Vignette-emotion Rating Means (with SD)

	DID (*n*=12)	Simulators (*n*=14)	Nonamnesic Comparisons (*n*=20)
Home Vignette			
Happiness	30.83 (27.79)	30.71 (20.93)	33.50 (30.31)
Negative Emotion	29.50 (25.41)	5.14 (6.41)	2.80 (8.45)
Park Vignette			
Happiness	22.50 (19.60)	42.14 (29.14)	32.50 (31.27)
Negative Emotion	37.83 (28.62)	11.71 (22.65)	2.50 (5.87)

Post-Experiment Simulator Performance Questionnaire

DID participants and simulators did not differ significantly based on the experimenter ratings of the presence of amnesia between identities, $F(1, 23) = 1.36$, $p = .256$, $\eta_p^2 = .06$, ratings of appearance of distinct dissociative identities, $F(1, 23) = 3.31$, $p = .082$, $\eta_p^2 = .13$,

and changes in appearance based on affect, $F(1, 23) = 1.09$, $p = .308$, $\eta_p^2 = .05$, , body posture, $F(1, 23) = .64$, $p = .431$, $\eta_p^2 = .03$, and voice characteristics, $F(1, 23) = .97$, $p = .336$, $\eta_p^2 = .04$. There was a trend for groups to differ on ratings of appearance based on behaviour, $F(1, 23) = 3.31$, $p = .082$, $\eta_p^2 = .13$ and facial characteristics, $F(1, 23) = 3.60$, $p = .071$, $\eta_p^2 = .14$, as well as presentation of feigned symptoms, $F(1, 23) = 3.80$, $p = .064$, $\eta_p^2 = .14$. The experimenter ratings suggest that DID participants and simulators were indistinguishable in their presentation.

Recall

Recall mean scores are reported in Table 5. The mixed measures ANOVA on Vignette (first vignette presented in identity A, second vignette presented in identity B) by Group (DID, simulator, amnesic comparison, nonamnesic comparison) indicated a significant main effect for Vignette, $F(1, 63) = 57.23$, $p < .001$, $\eta_p^2 = .48$, with more recall of stimuli from the first vignette. The Group main effect was also significant, $F(3, 63) = 34.86$, $p < .001$, $\eta_p^2 = .62$. Gabriel's post-hoc tests indicated that on tests of recall, DID participants were no different to simulators ($p = .773$), but they did recall significantly less information than amnesic ($p = .014$) and nonamnesic comparisons ($p < .001$). Simulators and amnesic comparisons did not differ in their recall ($p = .305$), but did recall significantly less stimuli than nonamnesic comparisons ($p < .001$; $p < .001$, respectively). Importantly for hypothesis one, the Vignette x Group interaction was significant, reflecting a difference in recall between groups across vignettes, $F(3, 63) = 29.98$, $p < .001$, $\eta_p^2 = .59$. In Identity A, DID participants presented a trend to recall significantly less words from the vignette encoded in identity B compared to that experienced in identity A, $t(11)$ 1.94, $p = .078$. A similar but more pronounced effect was found in the simulators who showed significantly less recall for identity B's information, $t(13)$ 8.22, $p < .001$, as did the amnesic comparisons, $t(20)$ 15.66, p

< .001. The nonamnesic comparisons showed an opposite trend of increased (instead of decreased) recall for the second vignette, $t(19)$ -1.81, $p = .086$.

On Vignette 1, a significant difference was present for Group, $F(3, 63) = 9.20$, $p < .001$, $\eta_p^2 = .31$, with Gabriel's post-hoc tests indicating that the DID participants had significantly lower recall of information they had experienced in identity A than simulators ($p = .045$), amnesic comparisons ($p < .001$) and nonamnesic comparisons ($p = .006$). The simulators did not differ significantly when compared to amnesic comparisons ($p = .120$) and nonamnesic comparisons ($p = .997$), nor did the comparison groups differ between one another ($p = .242$).

For Vignette 2, the groups also differed, $F(3, 63) = 64.42$, $p < .001$, $\eta_p^2 = .75$, with DID participants, simulators and amnesic comparisons showing less recall for identity B's vignettes compared with the nonamnesic comparisons ($p < .001$; $p < .001$; $p < .001$, respectively). The DID participants did not differ significantly on recall compared with simulators ($p = .606$) and amnesic comparisons ($p = .503$), nor did simulators and amnesic comparisons ($p = 1.000$).

Table 5

Vignette-dependent Means (with SD) for Recall

Diagnostic group	Vignette 1 hit proportion mean (*SD*)	Vignette 2 hit proportion mean (*SD*)
DID (*n*=12)	.20 (.17)	.08 (.14)
Simulator (*n*=14)	.39 (.18)	.00 (.00)
Amnesic Comparison (*n*=21)	.53 (.15)	.00 (.00)
Nonamnesic Comparison (*n*=20)	.42 (.19)	.56 (.24)

Recognition

Recognition mean scores are shown in Table 6.

Sensitivity. The mixed measures ANOVA on Vignette (first vignette presented in identity A, second vignette presented in identity B) by Group (DID, simulator, amnesic comparison, nonamnesic comparison) indicated a significant main effect for Test session, $F(1, 63) = 208.33$, $p < .001$, $\eta_p^2 = .77$, with greater sensitivity of test session 1 compared to test session 2. The Group main effect was also significant, $F(3, 63) = 49.17$, $p < .001$, $\eta_p^2 = .70$, with the DID, simulator and amnesic comparison groups being significantly less sensitive than the nonamnesic comparison group ($p < .001$; $p < .001$; $p < .001$, respectively). The DID participants did not differ from the simulators ($p = .177$) or amnesic comparisons ($p = .485$), nor did the simulators from the amnesic comparisons ($p = .962$). Importantly for hypothesis two, The Test session x Group interaction was significant, reflecting a difference in sensitivity between groups across test sessions, $F(3, 63) = 49.63$, $p < .001$, $\eta_p^2 = .70$. DID participants scored higher on sensitivity for identity A material (i.e., test session 1 compared to test session 2), encoded by identity A, $t(11) = 2.62$, $p = .024$. Simulators, $t(13) = 14.53$, $p < .001$, and amnesic comparisons, $t(20) = 25.27$, $p < .001$, were also more sensitive in identity A than identity B. Nonamnesic comparisons did not show a significant change across vignettes $t(19) = -.87$, $p = .395$.

For test session 1, groups differed significantly on sensitivity, $F(3, 63) = 3.038$, $p = .035$, $\eta_p^2 = .13$, with Gabriel's post hoc tests indicating that the DID participants scored significantly lower than amnesic comparisons ($p = .024$), although they did not differ significantly from simulators ($p = .351$) or nonamnesic comparisons ($p = .120$). Simulators did not differ from amnesic comparisons ($p = .890$) or nonamnesic comparisons ($p = .999$), nor did the comparison groups differ ($p = .982$). For test session 2, the groups differed, $F(3, 63) = 94.40$, $p < .001$, $\eta_p^2 = .82$, with DID participants demonstrating significantly higher

sensitivity than simulators ($p < .001$) and amnesic comparisons, but significantly lower sensitivity than nonamnesic comparisons ($p < .001$). Simulators and amnesic comparisons demonstrated significantly lower sensitivity than nonamnesic comparisons ($p < .001$; $p < .001$, respectively), while simulators and amnesic comparisons did not differ significantly ($p = 1.000$). This suggests that DID participants, simulators and amnesic comparisons are less sensitive in discriminating between previously experienced stimuli and distractors at test session 2, although nonamnesic comparisons show no difference in sensitivity between test session 1 and test session 2.

Response bias. The mixed measures ANOVA on Test session by Group (DID, simulator, amnesic comparison, nonamnesic comparison) indicated a significant main effect for Test session response bias, $F(1, 63) = 279.20$, $p < .001$, $\eta_p^2 = .82$, with greater response bias (i.e., participants are more conservative) in test session 2 compared to test session 1. The Group main effect was also significant, $F(3, 63) = 38.90$, $p < .001$, $\eta_p^2 = .65$, with DID participants, simulators and amnesic comparisons reporting higher response bias than nonamnesic comparisons ($p < .001$, $p < .001$, $p < .001$, respectively). The DID participants did not differ from the simulators ($p = .872$) or amnesic comparisons ($p = .822$), nor did the simulators from the amnesic comparisons ($p = 1.00$). The Test session x Group interaction was significant, reflecting a difference in response bias between groups across vignettes, $F(3, 63) = 61.20$, $p < .001$, $\eta_p^2 = .745$. DID participants showed a higher response bias in test session 2 (material encoded by identity B) compared to test session 1 (material encoded by identity A), $t(11) = -3.09$, $p = .010$. Simulators, $t(13) = -14.48$, $p < .001$, and amnesic comparisons, $t(20) = -27.77$, $p < .001$, also reported more response bias in identity B than identity A. Nonamnesic comparisons did not show a significant change $t(19) = .77$, $p = .454$.

For test session 1, groups differed significantly on response bias, $F(3, 63) = 3.145$, $p = .031$, $\eta_p^2 = .13$, with Gabriel's post hoc tests indicating that DID participants scored higher in

response bias than amnesic comparisons (p = .040). They also showed a trend towards significantly more response bias than simulators (p = .078) and nonamnesic comparisons (p = 0.71). Simulators did not differ significantly from amnesic (p = 1.000) or nonamnesic (p = 1.000) comparisons, nor did the comparison groups differ (p = 1.000). For test session 2, the groups differed, $F(3, 63) = 101.97$, $p < .001$, $\eta_p^2 = .83$, with post hoc tests indicating that DID participants, simulators and amnesic comparisons scored significantly higher response bias than nonamnesic comparisons ($p < .001$; $p < .001$; $p < .001$, respectively). Simulators and amnesic comparisons were also significantly higher on response bias than DID participants ($p < .001$; $p < .001$, respectively), while simulators and amnesic comparisons did not differ significantly (p = 1.000). This suggests that DID participants, simulators and amnesic comparisons were more conservative (i.e., more hesitant to indicate that they recognised sentences to represent events from the vignettes) at test session 2, whereas nonamnesics were more liberal.

Remember and Know Responses

Scores indicating the quality of the recognition are presented in Table 6. The mixed measures ANOVA for Test session by Group (DID, simulator, amnesic comparison, nonamnesic comparison) for remember responses indicated a significant main effect for Test session, $F(1, 63) = 179.97$, $p < .001$, $\eta_p^2 = .741$, indicating that there were more remember responses for identity A than identity B vignettes. The Group main effect was also significant, $F(3, 63) = 25.57$, $p < .001$, $\eta_p^2 = .55$, with DID participants, simulators and amnesic comparisons reporting significantly lower remember scores than nonamnesic comparisons ($p < .001$; $p < .001$; $p < .001$, respectively). DID participants did not differ from simulators (p = .991) or amnesic comparisons (p = .736), nor did simulators and amnesic comparisons differ (p = .986). Importantly for the third hypothesis, the Test session x Group interaction was significant, reflecting a difference in remembering between groups across test

sessions, $F(3, 63) = 37.19$, $p < .001$, $\eta_p^2 = .64$. DID participants, $t(11) = 5.37$, $p < .001$, simulators, $t(13) = 10.97$, $p < .001$, and amnesic comparisons, $t(20) = 8.79$, $p < .001$, characterised test session 1 responses more as remember recognitions compared to test session 2 (n.b., amnesic comparisons did not receive a second vignette story). Nonamnesic comparisons characterised test session 2 responses more as remember recognitions compared to test session 1, $t(19)$ -3.13, $p = .006$.

A one-way ANOVA on Group for test session 1 remember responses, $F(3, 63) = 2.29$, $p = .087$, $\eta_p^2 = .10$, indicated a trend of differences between groups. No post hoc tests were significant ($p > .125$).

A one-way ANOVA on Group for test session 2 remember responses showed a significant effect, $F(3, 63) = 53.91$, $p < .001$, $\eta_p^2 = .72$, with DID participants, simulators and amnesic comparisons showing significantly lower remember responses than the nonamnesic comparisons ($p < .001$). No other comparisons were significant (*p's* >.755).

For know responses, the main effect for Test session was not significant, $F(1, 63) = 1.17$, $p = .169$, $\eta_p^2 = .03$. The Group main effect was significant, $F(3, 63) = 8.38$, $p < .001$, $\eta_p^2 = .29$. DID participants knew significantly more stimuli than simulators ($p = .001$), amnesic comparisons ($p < .001$) and nonamnesic comparisons ($p < .002$). Simulators were not significantly different to amnesic comparisons ($p = 1.00$) or nonamnesic comparisons ($p = 1.000$), nor were amnesic or nonamnesic comparisons ($p = 1.00$). The Test session x Group interaction was not significant, $F(3, 63) = 1.38$, $p = .259$, $\eta_p^2 = 0.61$.

Table 6

Vignette-dependent and Overall Means (with SD) for Recognition and Quality

	DID (*n*=12)	Simulators (*n*=14)	Amnesic Comparison (*n*=21)	Nonamnesic Comparison (*n*=20)
Vignette-dependent recognition				
Hit rate Test session 1	.67 (.18)	.83 (.18)	.86 (.12)	.84 (.16)
Hit rate Test session 2	.35 (.18)	.01 (.05)	.02 (.04)	.88 (.12)
False alarm rate Test session 1	.03 (.05)	.05 (.10)	.03 (.08)	.04 (.06)
False alarm rate Test session 2	.01 (.03)	.02 (.04)	.02 (.07)	.03 (.05)
Sensitivity Test session 1	2.05 (.59)	2.45 (.62)	2.65 (.47)	2.53 (.60)
Sensitivity Test session 2	1.07 (1.14)	-.02 (.19)	.00 (.24)	2.70 (.51)
Response bias Test session 1	.51 (.30)	.20 (.38)	.20 (.29)	.22 (.28)
Response bias Test session 2	1.05 (.56)	1.55 (.16)	1.55 (.16)	.16 (.20)
Quality Remember/Know				
Remember Test session 1	.46 (.24)	.73 (.29)	.73 (.23)	.72 (.21)
Remember Test session 2	.17 (.19)	.01 (.03)	.01 (.04)	.84 (.15)
Know Test session 1	.22 (.17)	.10 (.21)	.13 (.16)	.12 (.15)
Know Test session 2	.27 (.30)	.01 (.03)	.00 (.02)	.04 (.09)

Discussion

The present study assessed the extent of transfer of episodic self-referential memory across amnesic identities in DID. On free recall, DID participants and simulators reported (in the case of DID a trend for) less memory of stimuli presented to identity B compared to identity A, when tested in identity A. Amnesic comparisons only recalled stimuli that were presented to them, while nonamnesic comparisons showed an increase in memory of the most recently presented stimuli (i.e., vignette 2/identity B stimuli). On tests of forced choice recognition, results were similar, DID participants and simulators reported less memory of stimuli presented to identity B, when tested in identity A, while amnesic comparisons showed no recognition of vignette 2 stimuli and nonamnesic comparisons showed no differences in memory for both sets of stimuli. Finally, the recognition sensitivity rates indicated that DID participants, simulators and amnesic comparisons also retrieved less information for the vignettes overall than nonamnesic comparisons. On the remember/know paradigm, DID participants and simulators indicated a reduction in remember responses for identity B material compared to identity A material. Amnesic comparisons also showed a reduction in remember responses for material that had not been presented to them. Nonamnesic comparisons presented no differences in remember responses for vignette stimuli. For know responses, no differences between the identity A and identity B material was found for any of the groups.

DID participants selected identities for participation that subjectively reported amnesia for material experienced in a different amnesic identity. The report of subjective amnesia was checked during the testing by the experimenter by asking the patients after a switch whether indeed they did not remember what was done in the other identity, which patients verified. On the measures of explicit memory retrieval, the results suggested

evidence of inter-identity amnesia. DID participants showed a trend for amnesia on tests of recall and recognised more stimuli from the vignette they had experienced in the same identity compared to that experienced in the other identity.

However, recall hit rates showed that there was a comparable pattern between DID participants, simulators and amnesic comparisons which hinders an unequivocal interpretation of the results. All three groups showed a significant reduction in recall and recognition of information presented to the amnesic identity and presented a comparable pattern of reduced remember responses for stimuli experienced by another identity, with no differences in know responses reported for stimuli experienced by another identity.

The result of a trend for amnesia for DID on measures of recall supports the findings of early research indicating that memory transfer cannot occur via explicit retrieval (Eich et al., 1997; Peters et al., 1998). However, it does not support recent research that has utilised more advanced and objective experimental procedures (Huntjens et al., 2005; Huntjens et al., 2007; Huntjens et al., 2002; Huntjens et al., 2003; Huntjens, Postma, et al., 2005; Huntjens et al., 2012; Kong et al., 2008). With regards to recognition, the current study found that DID participants were less able to recognise information learned in identity B compared to that learned in identity A, when assessed in identity A. This also contrasts with previous research showing transfer on measures of explicit retrieval (Huntjens et al., 2007; Huntjens et al., 2003). The findings of a decrease in remember responses for identity B stimuli do not support the previous reports of similarities in retrieval of memory with autonoetic or noetic consciousness (Huntjens et al., 2007; Huntjens et al., 2003). Importantly, however, previous research has used more objective methodology (e.g., interference paradigms; Huntjens et al., 2003) to ensure the simulation of amnesia is not possible. As the simulators in the present study were able to replicate the reduction in memory for identity B stimuli presented by DID participants on tests of recognition, it is difficult to determine the extent to which DID

amnesia is indicative of a true impairment in memory retrieval as their memory profile was able to be simulated (Huntjens et al., 2006). Yet, true amnesia also showed the same pattern as the simulators, so simulation and the presence of dissociative amnesia are both possible explanation for the DID findings in the current study.

A limitation of the study was that the free recall and recognition tasks occurred earlier for amnesic comparisons than the other groups (i.e., due to this group only hearing one vignette. As a result, the amnesic comparisons may have found the tasks more manageable. Future studies should include comparable time intervals between stimuli presentation and the tests, to ensure all groups had the same chance to consolidate their memory. Additionally, amnesic comparisons may have found the task easier due to them engaging less cognitive resources as a result of them receiving only half of the stimuli. However, as amnesic comparisons did not report significantly improved memory performance for their stimuli compared to the simulators and nonamnesic comparisons, this limitation does not fully explain their memory profile for test session 1.

It is important to recognise that relatively small sample sizes were included for the DID and simulator samples. Future studies should aim to include larger DID samples to replicate the current findings in a more powerful design. In addition, despite the subjective reports of amnesia in DID, the current study presents the results of a relatively stable DID sample due to the requirements of participants to be able to switch on demand. This tends to be only possible after extensive psychiatric therapy, and as a result, an assessment of the extent of episodic, self-referential memory transfer in people who have been more recently diagnosed with DID would be beneficial. As with any study involving switching, there is the possibility that a third identity may have influenced memory performance without the awareness of the researcher. Although participants were asked whether other identities had been involved, due to this being assessed via self-report, this possibility cannot be ruled out.

Future research should also attempt to more closely match education level across DID and comparison groups to remove the possibility that differences in education may have influenced the results. Although comparisons were selected to match the demographic information of the DID sample, the mean DID group education level proved lower in the final sample due to some participants being excluded from the analysis.

The present study assessed transfer for the memory of episodic self-referential information. While the DID patient data seemed to support the idea of an amnesic barrier between identities, it is difficult to draw a conclusion given that the profile of amnesia was possible to be simulated. There is thus a need for future studies entailing more advanced and objective experimental procedures.

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Chapter 3

Inter-Identity amnesia for episodic, autobiographical memory in Dissociative Identity Disorder

Abstract

Amnesia is a core diagnostic criterion for Dissociative Identity Disorder (DID). In this experiment, behavioural tasks were used to assess the nature of amnesia for episodic, autobiographical memories across identities. Nineteen DID participants, 16 DID simulators and 41 comparison participants from the general population were recruited. They engaged in two sets of tasks (DID and simulator participants completed one in each identity). Free recall and recognition for the stimuli were assessed. Subjectively, all DID participants reported amnesia for events that occurred in the other identity. On tests using measures of explicit retrieval, they presented a memory profile of amnesia similar to simulators instructed to feign amnesia and amnesic comparisons. The comparable performance of DID participants to both amnesic comparisons and simulators hinders unequivocal interpretation of results. DID participants did present poorer memory retrieval overall on tasks of recall than the comparison groups. Although the results of explicit memory retrieval inability are consistent with the subjective reports of DID impairment in retrieving episodic autobiographical memory, the use of a more objective assessment of memory retrieval is required to explore the nature and extent of inter-identity amnesia.

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Inter-Identity amnesia for episodic, autobiographical memory in dissociative identity disorder

Compartmentalised identities are reported in people with Dissociative Identity Disorder (DID), with the extent of inter-identity accessibility of experiences not entirely understood. Amnesia is a core diagnostic criteria of DID (American Psychiatric Association [APA]). It can present as two-way (with no perceived transfer of information occurring across identities) or one-way (with only one identity perceiving access to the memories of the other; Bryant, 1995; Ellenberger, 1970). Inter-identity amnesia is often reported between identities who differ in their remembering of traumatic experiences. Although one identity may report knowledge of traumatic experiences from the past, the other may claim full amnesia of these events (Kluft, 2007; Van der Hart, Nijenhuis, & Steele, 2006).

Previous research using measures of explicit and implicit memory retrieval have found evidence of transfer of information across identities reporting amnesia (Allen & Movius, 2000; Elzinga, Phaf, Ardon, & Van Dyck, 2003; Huntjens et al., 2005; Huntjens, Peters, Woertman, Van der Hart, & Postma, 2007; Huntjens, Postma, Hanmaker, Woertman, & Van der Hart, 2002; Huntjens, Postma, Peters, Woertman, & Van der Hart, 2003; Huntjens, Postma, Woertman, Van der Hart, & Peters, 2005; Huntjens, Verschuere, & McNally, 2012; Kong, Allen, & Glisky, 2008; Peters, Uyterlinde, Consemulder, & Van der Hart, 1998; Silberman, Putnam, Weingartner, Braun, & Post, 1985). These studies have examined procedural, semantic, episodic and semantic autobiographical memory, but not necessarily episodic autobiographical memory. Research has indicated little support for subjectively reported inter-identity amnesia, with inter-identity transfer reported for stimuli encoded into different memory systems. There also appears to be little difference in whether memories are retrieved with autonoetic or noetic consciousness (Huntjens et al., 2003). Autonoetic consciousness is paired with episodic memories and involves a person having the

ability to access details about the event and feel as though it was them that experienced it. Noetic consciousness is paired with semantic memories and involves a person simply knowing that an event happened to them, but without being able to access recollection of actually experiencing the event (Tulving, 1985). Understanding episodic autobiographical memory is important for DID as identities often claim different levels of access to memories for personal experience, including those of traumatic events (American Psychiatric Association, 2013). As the DSM-5 criteria for the disorder include the presence of separate identities that hold distinct life memories of episodic autobiographical events, understanding the extent of this reported amnesia may provide insight into whether there is potential for identities to recognise experiences they attribute to another aspect of self.

The current study aimed to determine whether the reported impairment in memory transfer across amnesic identities was evident for episodic autobiographical memories (i.e., information from actually experienced events). To assess the pervasiveness of amnesia in DID, comparison samples were included in this study. Two non-clinical comparison groups were recruited, one that had full access to all material and a second group of people who were truly amnesic for some of the material assessed. A group of people instructed to consciously simulate DID was also included. The inclusion of this group is recommended in research to investigate the possibility that socio-cognitive factors (e.g., therapist suggestion) may give rise to the disorder (Boysen & VanBergen, 2014; Huntjens et al., 2012). By comparing a group diagnosed with DID to a group of simulators, research can assess the cognitive profile of both groups, generating further knowledge about the aetiology of DID and disorder presentation (Boysen & VanBergen, 2014). In line with this recommendation, participants were from four samples: DID participants reporting two-way amnesia, non-clinical comparison participants who experienced half of the events (amnesic group) or the full set (nonamnesic group), and simulator participants educated about how to imitate DID.

For DID participants, two identities were used who were amnesic for events experienced by the other identity. Free recall and forced choice recognition tasks were used to assess explicit memory retrieval for events experienced in their own identity compared with an amnesic identity. As in Chapter two, a remember/know paradigm was included to assess whether, in the presence of transfer, the memories were accessed with noetic or autonoetic consciousness (Huntjens et al., 2003). Based on the research presented in Chapters one and two, the current study tested the following three hypotheses: (1) For free recall, DID participants would exhibit amnesia for behavioural tasks encoded in a different amnesic identity, a similar profile to amnesic comparison responding. (2) For forced choice recognition, a similar pattern of results was predicted, (3) For remember and know responses, DID participants would exhibit a higher level of autonoetic consciousness for memories encoded in the same identity compared to those encoded in the other identity, comparable to amnesic comparisons. Nonamnesic comparisons would exhibit comparable levels of autonoetic and noetic performance across the different material.

Method

Participants

DID sample. A total of 19 DID participants were referred by clinicians and nurses, and from a hospital-based programme in Brisbane, Australia. The target sample size was 20, a number based on pre-existing studies of inter-identity transfer (for example, Huntjens et al., 2003). Clinicians working with people with DID or referring to the hospital programme were sent information and invitation letters for the study to distribute to those they felt were stable enough to receive the information. Nurses at the hospital gave the invitation letter to DID patients attending hospital programmes. Conditions for inclusion in the study were (1) a pre-existing DID diagnosis; (2) a confirmation of DID diagnosis via the Dissociative Disorders Interview Schedule (DDIS), administered by the principal researcher; (3) the capacity to

engage two identities to take part who reported no knowledge of events that occur in the other identity; (4) the identities had no awareness of the other's experiences, and one should be aware of distressing autobiographical events in their past, while the other should have no awareness of such experiences[4]; and (5) the ability to switch between the two selected identities when the experimenter required. Participants were excluded from the study if they (1) were unable to concentrate on the computer tasks, (2) were unable to switch between identities on request, (3) were unable to maintain a single identity in executive control, or (4) there was no amnesia subjectively indicated between their selected identities. As a result of the inclusion and exclusion criteria, five participants were removed for: failing to complete the task (n = 1), being unable to switch between identities (n = 3), or experiencing test interference from a third identity (n = 1). Fourteen participants were included in the final sample. Of the 14 DID participants tested, one was removed from the recall analysis for failing to complete the task. Participants were told that the study would examine memory in different identities in people with DID. Participants chose the two identities (identified as A and B) to take part in the study. They received a $20 shopping voucher for their participation. The DID participants were from the same sample as the DID participants who participated in Chapter two.

Comparison samples. A total of 41 comparison participants were recruited for the study. People were invited to take part in a study researching memory in different groups. Members of the Christchurch and Brisbane general population were recruited using snowball sampling (n = 26). A participant research pool for undergraduate psychology students and advertisements placed around a psychology department (n = 15) also invited people to

[4] This was to reflect a different emotional make-up in each identity, which has been used in other studies (Huntjens et al., 2012; Reinders et al. 2014).

participate. Inclusion in the study required participants to have no memory or attentional deficits. Participants were randomly assigned to the *'amnesic'* comparison group or the *'nonamnesic'* comparison group. Amnesic comparisons received only the memory stimuli presented to identity A in the DID and simulator groups (see procedure), while nonamnesic comparisons received the memory stimuli presented to both identities. Comparison participants were selected to match the DID participants number, gender, and age in order to remove the influence of demographic confounders. Comparison participants were unaware the research was investigating DID and received a $20 shopping voucher for participating. The comparison participants were from the same sample as those who participated in Chapter two.

Simulator sample. A total of 16 simulator participants were recruited for this study. The target sample size was 20 in order to match the DID patient sample. The sample included professional and amateur actors from a University Theatre and Film Department, as well as theatre companies based in Christchurch, New Zealand. They were selected as closely as possible given the limited pool to match the gender and age demographic attributes of DID participants to remove the influence of demographic confounders. Simulator participants created two amnesic identities. Two simulators were removed from the recall analysis for refusal to complete the full test session. Participants received $20 of shopping vouchers for their participation and were instructed that the person who best simulated DID would receive a $50 payment.

Table 1 displays the demographic details for each sample. For the sample included in the free recall task, the groups presented a significant difference on age, $F(3, 64) = 3.81$, $p = .014$, $\eta_p^2 = .152$. Simulators were significantly younger than DID participants ($p = .023$) and amnesic comparisons ($p = .036$) and showed a trend to be significantly younger than the nonamnesic comparisons ($p = .066$). No other comparisons were significant. For the sample

included in the forced choice recognition task, the groups presented a trend to differ significantly for age, $F(3, 67) = 2.48$, $p = .069$, $\eta_p^2 = .10$. Simulators showed a trend of younger age compared to DID participants ($p = .084$). No other comparisons reported a trend. For both tasks, there were minimal variations in gender, but due to the low count for males across groups, inferential statistics were not conducted. Inferential statistics were also not utilised for ethnicity and education due to cells with low counts. The simulator participants were from the same sample as used in Chapter two.

Table 1

Participant Demographic Data across Groups

	DID Free Recall Task (*n* = 13)	DID Forced Choice Task (*n* = 14)	Simulator Free Recall Task (*n* = 14)	Simulator Forced Choice Task (*n* = 16)	Amnesic Comparison (*n* = 21)	Nonamnesic Comparison (*n* = 20)
Age *M (SD)*	41.00 (3.45)	41.29 (3.21)	28.86 (3.85)	31.38 (3.79)	39.10 (1.90)	38.35 (1.62)
Sex *n* (%)						
Male	0 (0%)	0 (0%)	2 (14.3%)	2 (12.5%)	1 (4.8%)	1 (5%)
Female	13 (100%)	14 (100%)	12 (85.7%)	14 (87.5%)	20 (95.2%)	19 (95%)
Ethnicity*						
New Zealand European	0 (0%)	0 (0%)	12 (85.7%)	13 (81.3%)	11 (52.4%)	16 (80%)
Maori	0 (0%)	0 (0%)	0 (0%)	1 (6.3%)	0 (0%)	0 (0%)
Australian European	10 (76.9%)	11 (78.57%)	2 (14.3%)	2 (12.5%)	1 (4.76%)	0 (0%)
European Other	3 (23.1%)	3 (21.43%)	1 (7.1%)	2 (12.5%)	5 (23.8%)	0 (0%)
Other	2 (15.4%)	2 (14.3%)	0 (0%)	0 (0%)	5 (23.8%)	4 (20%)
Qualification§						
High school certificate	3 (23.1%)	4 (28.6%)	7 (50%)	7 (43.8%)	2 (9.5%)	2 (10%)
Post-high school non-university (e.g. Trade certificate)	2 (15.4%)	2 (14.3%)	0 (0%)	0 (0%)	8 (38.1%)	7 (35%)
University level	6 (46.2%)	6 (42.9%)	7 (50%)	9 (56.2%)	11 (52.4%)	11 (55%)

* For the dissociative identity disorder (DID) groups, two participants chose two ethnicities. For the free recall simulator group, one participant chose two ethnicities. For the forced choice recognition simulator group, two participants chose two ethnicities. For the amnesic comparison group, one participant chose two ethnicities. For the nonamnesic comparison group, one participant chose two ethnicities, and one participant did not indicate an ethnicity.

§ For the DID groups, two participants reported attaining no qualifications.

Material

All participants completed the behavioural tasks and a questionnaire battery.

Behavioural tasks. Two sets of behavioural tasks were created for the study that were designed to provide unique episodic autobiographical experiences that could be used to assess memory retrieval across the two identity states that subjectively reported amnesia. The first set of tasks required participants to take out their mobile phone, place it on silent and put it by a pot plant. They were then instructed to find a book which was placed under a stack of white papers. They retrieved a pamphlet from inside the book and were instructed to find a loose piece of paper which had pictures of a circle, triangle and square printed on it. Under each shape were instructions on how to draw them. Participants were then required to draw the shapes on a blank piece of paper in the same orientation printed on the original sheet. They coloured the circle in blue, the triangle in red and the square in green using coloured pencils. Participants were then asked to choose their favourite coloured pen and write their first name under the circle and using their second favourite coloured pen, their birthday under the square. Participants were then asked to look at their drawn shapes and think of a memory that it reminded them of. They were asked to visualise this memory for 15 seconds.

The second set of tasks involved participants tracing a picture of a dog followed by filling up three plastic cups with water to three different levels depicted by lines drawn on the side of the cups. They were then asked to place the cups in order from most to least filled.

Participants then completed an origami task where they followed the instructions of the experimenter to create a finger pointer. Participants then used this to point to five photos of celebrities and name them. They were asked to put them in order from their most to least liked, choose the celebrity they saw as most similar to themselves and provide a reason for their decision. The complete instructions for each behavioural task can be found in Appendix E-4.

Questionnaires. All participants completed the Dissociative Experiences Scale (DES), the PTSD Symptom Scale - Self-Report (PSS-SR) and a demographic questionnaire. DID and simulator participants completed the Dissociative Disorders Interview Schedule (DDIS). The interviewer completed a Post-Experiment Questionnaire for DID and simulator participants. All questionnaires are presented in Appendix D. The questionnaires used in this study were also used in the research presented in Chapter two.

DES (Carlson & Putnam, 1993). The DES is a self-report questionnaire measuring general dissociative experiences and symptoms over 28 items (Carlson & Putnam, 1993) (see Appendix D-2). Participants specify the percentage of time they experience a dissociative experience when not impaired by alcohol and drugs through the use of an eleven point scale ranging from 0 (never) to 100 (always). A mean is calculated, with scores ranging from 0 to 100. The DES was used in this study as a measure of current pathological and non-pathological dissociative experiences. It is suitable for gauging dissociative experiences across the participant groups used in this study (i.e., participants with a dissociative diagnosis as well as non-clinical controls). The DES has excellent psychometric properties and has been used in clinical populations with and without dissociative diagnoses and non-clinical populations (Bernstein Carlson et al., 1993; Brand et al., 2009; Carlson & Putnam, 1993; Dell, 2002; Kennedy et al., 2004; Lipsanen, Saarijärvi, & Lauerma, 2003; Perona-Garcelán et

al., 2012; Tsar, Kundakci, Kiziltan, Bakim, & Bozkurt, 2001). Table 2 shows the alphas for each sample in the current study.

PSS-SR (Foa, Riggs, Dancu, & Rothbaum, 1993). The PSS-SR (see Appendix D-3) was used to assess the presence of PTSD symptoms as DID is often co-morbid with PTSD (Boon & Draijer, 1993; Vermetten, Schmahl, Lindner, Loewenstein, & Bremner, 2006). The PSS-SR is a diagnostic 17-item self-report questionnaire which assesses for the presence and severity of PTSD symptoms in people who have experienced traumatic events (Foa et al., 1993). People indicate the regularity of PTSD symptoms over the last two weeks on a scale from 0 (not at all) to 3 (five or more times per week/very much/almost always). The PSS-SR has good psychometric properties (Foa et al., 1993). The alphas of each sample in the current study are shown in Table 2.

Demographic Questionnaire. The demographic questionnaire consisted of questions about participant age, gender, ethnicity and education level (see Appendix D-4). It was included to verify that simulators and comparisons were matched as closely as possible to DID participants on these characteristics.

DDIS (Ross et al., 1989). The DDIS is a structured interview used to diagnose dissociative disorders. The DID section of the interview was used to make a structured clinical interview diagnosis of DID independent of previous diagnoses, a method previously used in Dorahy, Middleton and Irwin (2005) and Dorahy, McCusker, Loewenstein, Colbert and Mulholland (2006) (see Appendix D-1). Respondents answer questions about whether they have experienced having distinct identities, whether these identities take control of their behaviour, whether they experience difficulty in recalling important personal information and whether these experiences are due to substance abuse. The DDIS is a psychometrically sound measure assessing the presence of dissociative disorders (Ross et al., 1989). Interrater

reliability indicates substantial agreement across clinicians, with a reported kappa value of 0.68 (Ross et al., 1989).

Post-experiment Questionnaire. The principal researcher was blind to whether DID participants and simulators had a diagnosis of DID or were feigning the disorder as a simulator. A post-interview questionnaire was included for the principal researcher to state whether DID participants and simulators appeared to present with symptoms of DID. The researcher stated whether participants appeared to have distinct identities and the ways their appearance differed. The researcher also stated whether there appeared to be amnesia between the identities and whether the person appeared to have DID. The post-experiment questionnaire was used to establish if simulators could successfully mimic DID presentation (i.e., have the researcher believe they had DID) in addition to presenting the same amnesic profile measured via retrieval tasks. The post-experiment questionnaire is presented in Appendix D-7.

Table 2

Cronbach's alpha for DES by Group

Group	DES	PSS-SR
DID (*n* = 14)	.78	.84
Simulator (*n* = 16)	.96	.87
Amnesic Comparison (*n* = 21)	.88	.90
Nonamnesic Comparison (*n* = 20)	.99	.93

Experimental Measures.

Free Recall (FR).

Once both sets of behavioural tasks had been administered, participants were instructed to state the details that could be recalled. The free recall task occurred approximately 10 minutes after the presentation of the behavioural tasks. Following their recall of one of the sets of tasks, if they did not freely recall the other tasks (e.g., DID participants, simulators), they were prompted with, "did you take part in any other tasks?. A positive response brought an invitation to detail those tasks. A negative response resulted in the researcher presenting an additional prompt of "do you remember anything about a mobile phone or tracing task?" If the response was negative, the researcher asked, "do you remember anything about drawing shapes or filling cups?" The prompts were included to assess if DID participants and simulators could explicitly retrieve information of events experienced in their amnesic identity. Amnesic comparisons were also prompted to recall a second set of behavioural tasks, despite only being exposed to one set.

Forced Choice Recognition.

Stimuli Recognition. Participants were presented with 40 sentences each individually placed in the centre of a computer screen. Half of these (i.e., ten and ten sentences) were related to each behavioural task (20 in total), and 20 were not related to either set of behavioural tasks (distractor stimuli) (Appendix E-9). Participants specified whether they recognised the sentences as representing details of events from the behavioural tasks by pressing the Y key on the keyboard, or if they did not recognise them, by pressing the N key. The order of sentence presentation was randomised across each participant. The forced choice recognition task was used to assess recognition memory of the tasks. It was administered 20 minutes after exposure to the second and final set of behavioural tasks. During this time interval, participants performed unrelated tasks.

Remember/know. If participants recognised a sentence as representing an experience from the behavioural tasks, they were asked to establish whether they 'remembered' or 'knew' that it had happened. Participants were told to choose a 'remember' response when the sentence was paired with an actual recollection of the event. A 'know' response was to be selected when the event was paired with only a feeling that it had happened. For example, the memory of going to a restaurant would be classified as a 'remember' response if the person was able to remember visual, auditory or tactile details of the event (which restaurant they went to, where they sat in the restaurant, whether they were alone or with others, what went through their mind at the time). The event would be classified as a 'know' response if the participant could not recall any details about the experience, but felt it had happened (i.e., they felt they had been to the restaurant). Participants pressed the R key on the computer keyboard to select a 'remember' response, and the K key to select a 'know' response. This task was used to evaluate autonoetic and noetic memory retrieval.

Procedure

The present study was part of a more extensive investigation of memory transfer in DID. Measures unconnected to the present study included free recall and forced choice recognition tasks assessing inter-identity transfer of episodic self-referential memories (Chapter two), and an implicit association test of episodic, self-referential memory transfer (Chapter four). In the present study, exposure to stimuli occurred after the exposure to material of the other studies. Written informed consent was required from all participants. The study was permitted by both the University and Hospital Research Ethics Committees.

Simulator training phase. To begin, participants rated their knowledge of DID from very knowledgeable to having no knowledge (Appendix C-1) and indicated whether they experience visual, memory or attentional impairments. Participants were then shown a video outlining DID to provide information about how to simulate the disorder. The video was 8.27

minutes long and used clips from two documentaries "Multiple Personality Disorder: The Search for Deadly Memories" (Moss, Nevins, & Mierendorf, 1993) and the trailer of "When the Devil Knocks" (Harper, Palmer, & Slinger, 2010). Both clips presented people with DID, information about how and why it develops and the progression of therapy. A Dissociative Identity Disorder Information Sheet was also given to participants which contained three pages of information outlining the DSM-5 DID diagnostic criteria as well as answers to frequently asked questions (e.g., do people actually have multiple personalities, how do the identities develop, is it obvious when a person switches personalities, what are the symptoms of DID, is DID a major health problem and can dissociative disorders be cured?) (Appendix C-2). The information sheet was modified from one supplied by the Sidran Foundation. An Identity/Character Description Sheet was also made available, where participants completed 18 questions about their identity. Participants were taught how to mimic DID, including through practice instructions about how to create and switch between identities. They were given a checklist of 18 characteristics of their simulated identities that needed to be highly detailed. These participants were told to convince the researcher who was conducting the assessment session, and who was blinded to their simulator status, that they had a DID diagnosis. They were given one-to-two weeks to practice having DID and develop their amnesic dissociative identity before the experimental session.

Experimental Procedure.

The study was conducted in five phases: (1) questionnaire battery completion, (2) behavioural task presentation, (3) free recall task (4) forced choice recognition task and (5) post-experiment questionnaire completion.

Phase 1. All participants signed a written informed consent form (Appendix B-7). The principal researcher then administered the DDIS. Participants then completed their

demographic information and the DES and PSS-SR, which were presented on the Qualtrics survey platform. The order of the final three questionnaires was randomised.

Phase 2. Participants completed the behavioural task where they engaged with one or two sets of tasks, depending on their group allocation. The order of the behavioural task set presentation was counterbalanced across participants. [5]

- DID and simulator participants engaged with one set in identity A and then switched to their amnesic identity (identity B) where they engaged with a second set.
- Amnesic comparisons engaged with only one set.
- Nonamnesic comparisons engaged with both sets.

Participants were told to remember as many details as possible from their experience of the first behavioural exercise, with the aim of aiding memory encoding of the tasks. Once it had concluded, DID and simulator participants were asked to switch into their second identity. They were asked whether they remembered anything that had occurred in Identity A. They were then administered the second set of tasks and again asked to remember what they

[5] Nine of the final DID sample received the first set of behavioural tasks in identity A, and five received the second set of behavioural tasks in identity A. Seven of the final simulator sample received the first set of behavioural tasks in identity A, and seven received the second set of behavioural tasks in identity A. Ten amnesic comparisons received the first set of behavioural tasks in identity A and eleven received the second set of behavioural tasks in identity A. Ten nonamnesic comparisons received the first set of behavioural tasks in identity A and ten received the second set of behavioural tasks in identity A.

had experienced. Nonamnesic comparisons were presented with the second set of tasks directly after receiving the first.

Phase 3. Following a short break, DID participants and simulators were asked to switch back to identity A and were asked whether they remembered anything that had occurred in Identity B. Participants were then requested to recall all the details they could remember from the first set of behavioural tasks they experienced (i.e., the delayed recall test to measure explicit memory retrieval after the elapsing of time, which is more consistent with episodic memories for life experience). They were then asked to recall information from any other behavioural tasks they had experienced.

Phase 4. Participants were required to complete a forced choice recognition task, in which they had to state whether they recognised sentences as representing events that had happened during the tasks. If they responded affirmatively, they were required to state whether they 'remembered' or 'knew' that these events had happened. DID participants and simulators completed their testing in identity A.

Phase 5. The principal researcher completed the post-experiment questionnaire for DID participants and simulators.

Data Analysis

Recall. The number of tasks correctly recalled from each behavioural set was assessed. Identity A recall was compared with identity B recall. The proportion of hits (correct stimuli divided by the total number of task stimuli) was calculated.

Recognition. Recognition hit rates were calculated for each behavioural task (correct stimuli divided by the total task stimuli). False alarms, sensitivity and response bias were also calculated for each set of behavioural tasks. Sensitivity and response bias were calculated using z-score procedures detailed in MacMillan and Creelman (2005) to gain *d'* and c. *d'* was used to convey sensitivity and calculates the proportion of stimuli presented to the

participants that was coded as being previously seen (hits), while correcting for distractor stimuli that were incorrectly coded as being previously seen (false alarms) (*d'* = z(H) – z(F)). c was used to convey response bias and yields a participant's likelihood to respond yes or no to stimuli as having previously been seen. It is calculated using the midpoint between z(F) and z(H) (c = - [z(H) + Z(F)]/2).

Remember/know. A remember and know rate was calculated for each behavioural task by dividing stimuli categorised as remembered or known by participants hits for that set of behavioural tasks.

Results

Questionnaires

Dissociative experiences differed signficantly across groups, $F(3, 67) = 54.40$, $p < .001$, $\eta_p^2 = .709$. DID participants ($M = 55.48$, $SE = 10.92$) scored significantly higher than simulators ($M = 42.37$, $SE = 20.59$; $p = .032$), amnesic comparisons ($M = 11.34$, $SE = 7.77$; $p < .001$) and nonamnesic comparisons ($M = 10.89$, $SE = 8.40$; $p < .001$). Simulators also presented a significantly higher score than amnesic ($p < .001$) and nonamnesic ($p < .001$) comparisons. Comparison participants did not show a significant difference ($p = 1.000$).

PTSD symptoms were higher in DID participants ($M = 41.86$, $SE = 8.51$) than simulator ($M = 22.25$, $SE = 9.42$; $p < .001$), amnesic comparisons ($M = 7.19$, $SE = 7.01$; $p < .001$) and nonamnesic comparisons ($M = 11.30$, $SE = 10.48$; $p < .001$), $F(3, 67) = 48.42$, $p < .001$, $\eta_p^2 = .68$. Simulators also presented higher PTSD symptoms than amnesic ($p < .001$) and nonamnesic comparisons ($p = .003$). Comparisons did not differ ($p = .601$).

All DID participants ($n = 14$) and simulators ($n = 4$) who were administered the DDIS had their diagnosis of dissociative identity disorder (feigned in the simulator group) confirmed.

Post-Experiment Simulator Performance Questionnaire

DID participants and simulators did not differ significantly based on the experimenter ratings of the presence of amnesia between identities, $F(1, 26) = 3.05$, $p = .093$, $\eta_p^2 = .11$, and changes in appearance based on affect, $F(1, 26) = 1.16$, $p = .291$, $\eta_p^2 = .04$, behaviour, $F(1, 26) = 3.02$, $p = .094$, $\eta_p^2 = .104$, body posture, $F(1, 26) = .50$, $p = .487$, $\eta_p^2 = .02$, voice characteristics, $F(1, 26) = .83$, $p = .372$, $\eta_p^2 = .03$, or facial characteristics, $F(1, 26) = 2.43$, $p = .131$, $\eta_p^2 = .09$, across identities. Participants did differ significantly across groups based on the ratings of feigning of symptoms, $F(1, 26) = 4.32$, $p = .048$, $\eta_p^2 = .14$, that is, simulators were rated as significantly more likely to be feigning their symptoms of DID ($M = 1.67$, $SE = .724$) than DID participants ($M = 1.15$, $SE = .56$). Participants also differed significantly across groups based on ratings of appearance of distinct dissociative identities, $F(1, 26) = 4.39$, $p = .046$, $\eta_p^2 = .14$. Simulators ($M = 1.3$, $SE = .46$) were also rated as being more likely to present questionable or no dissociative identities than DID participants ($M = 1.00$, $SE = .00$). In short, the experimenter ratings suggest that DID participants and simulators were indistinguishable on items associated with their presentation of amnesia and appearance of their identities, however they did appear to be less dissociated from one another and more likely to be feigning their symptoms.

Recall

Recall mean scores are reported in Table 3. As ANOVA is considered to be robust against violations of assumptions (Blanca, Alarcón, Arnau, Bono, & Bendayan, 2017; Nimon, 2012), the data was not altered. The mixed ANOVA on Test session (behavioural tasks 1 presented first in identity A, behavioural tasks 2 presented second in identity B) by Group (DID, simulator, amnesic comparison, nonamnesic comparison) indicated a significant main effect for Test session, $F(1, 64) = 72.69$, $p < .001$, $\eta_p^2 = .53$, with more recall of stimuli from the first test session. The Group main effect was also significant, $F(3, 64) = 78.78$, $p <$

.001, η_p^2 = .79. Gabriel's post hoc tests indicated that on tests of recall, DID participants were no different to simulators (p = 1.000), but they did recall significantly fewer stimuli than amnesic (who only got identity A stimuli; p = .006) and nonamnesic comparison groups (p < .001). Simulators also recalled significantly less stimuli than amnesic (p = .006) and nonamnesic comparison groups (p < .001), and amnesic comparisons recalled significantly less stimuli than nonamnesic comparison groups (p < .001). Important for hypothesis one, the Session x Group interaction was significant, reflecting a difference in recall between groups across sessions, $F(3, 64) = 28.72$, p < .001, η_p^2 = .57. In Identity A, DID participants trended towards recalling more words from the events they had experienced in identity A compared to the events experienced in identity B, $t(12)$ 2.10, p = .057. The simulators showed significantly less recall for identity B's information, $t(13)$ 6.76, p < .001, as did amnesic comparisons, $t(20) = 8.24$, p < .001. The nonamnesic comparisons showed a significant increase in recall for identity B's information, $t(19) = -3.10$, p = .006, potentially demonstrating a recency recall effect in this group.

On test session 1 (i.e., identity A for DID and simulators), a significant difference was present for group, $F(3, 64) = 13.11$, p < .001, η_p^2 = .38, with Gabriel's post hoc tests indicating that DID participants had significantly lower recall of information they had experienced in identity A than amnesic and nonamnesic comparisons (p < .001). The simulators also differed from the comparison groups (p = .007; p = .005), but not from the DID participants (p = .490). The comparison groups did not differ (p = 1.000).

For the behavioural tasks presented in test session 2 (i.e., identity B for DID and simulators), the groups also differed, $F(3, 64) = 149.45$, p < .001, η_p^2 = .88, with DID participants, simulators and amnesic comparisons showing less recall for identity B's tasks compared with the nonamnesic comparisons (p < .001; p < .001; p < .001, respectively). DID participants trended towards recalling more words from the events experienced in Identity B

than simulators (p = .080). DID participants did not differ significantly on recall compared with amnesic comparisons (p = .159), nor did simulators and amnesic comparisons (p = .994).

Table 3

Behavioural Task-dependent Means (with SD) for Recall

Diagnostic group	Behavioural Tasks 1 hit proportion mean (*SD*)	Behavioural Tasks 2 hit proportion mean (*SD*)
DID (*n*=13)	.29 (.18)	.13 (.20)
Simulator (*n*=14)	.42 (.22)	.00 (.01)
Amnesic Comparison (*n*=21)	.67 (.26)	.03 (.14)
Nonamnesic Comparison (*n*=20)	.68 (.16)	.77 (.12)

Recognition

Recognition memory scores are shown in Table 4. One stimulus from behavioural tasks set 1 was removed from the recognition sentences due to it being rated as too similar to other stimuli. Two stimuli from behavioural tasks set 2 were removed from data analysis due to them being rated as too similar to other stimuli upon closer inspection. These omissions were to ensure all stimuli were unique, to most thoroughly assess inter-identity amnesia for unrelated material.

Table 4

Time-Dependent and Overall Means (with SD) for Recognition and Quality

	DID (*n*=14)	Simulators (*n*=16)	Amnesic Comparison (*n*=21)	Nonamnesic Comparison (*n*=20)
Behavioural Task-dependent recognition				
Hit rate session 1	.79 (.16)	.92 (.12)	.89 (.23)	.93 (.09)
Hit rate session 2	.38 (.36)	.03 (.05)	.10 (15)	.95 (.06)
False alarm rate session 1	.04 (.09)	.02 (.05)	.03 (.06)	.02 (.05)
False alarm rate session 2	.03 (.06)	.03 (.09)	.02 (.06)	.02 (.04)
Sensitivity session 1	2.25 (.52)	2.73 (.42)	2.74 (.38)	2.74 (.42)
Sensitivity session 2	1.06 (1.03)	.00 (.25)	.27 (.45)	2.82 (.27)
Response bias session 1	.27 (.34)	.12 (.22)	.06 (.23)	.10 (18)
Response bias session 2	.90 (.60)	1.43 (.19)	1.34 (.29)	.06 (.15)
Quality Remember/Know				
Remember session 1	.76 (.23)	.96 (.08)	.96 (.13)	.93 (.14)
Remember session 2	.12 (.16)	.01 (.04)	.07 (.15)	.54 (.43)
Know session 1	.24 (.23)	.04 (.08)	.04 (.13)	.07 (.14)
Know session 2	.13 (.14)	.01 (.03)	.04 (.02)	.08 (.16)

Sensitivity. The mixed measures ANOVA on Test session (set presented first, set presented second) by Group (DID, simulator, amnesic comparison, nonamnesic comparison) indicated a significant main effect for Test session sensitivity, $F(1, 67) = 388.35$, $p < .001$, $\eta_p^2 = .85$, with a generally greater sensitivity of behavioural task 1 compared to behavioural task 2. The Group main effect was also significant, $F(3, 67) = 60.95$, $p < .001$, $\eta_p^2 = .73$, with the DID, simulator and amnesic comparison groups being overall significantly less sensitive than the nonamnesic comparison group ($p < .001$; $p < .001$; $p < .001$, respectively). The DID participants did not differ from the simulators ($p = .167$) or amnesic comparisons ($p = .783$), nor did the simulators from the amnesic comparisons ($p = .799$). Important for hypothesis two, the Test session x Group interaction was significant, reflecting a difference in sensitivity between groups across Test sessions $F(3, 67) = 71.76$, $p < .001$, $\eta_p^2 = .76$. In identity A, DID participants were more sensitive in behavioural task 1 compared to behavioural task 2 encoded by identity B, $t(13)$ 3.84, $p = .002$. Simulators, $t(15)$ 27.56, $p < .001$, and amnesic comparisons, $t(20)$ 20.28, $p < .001$, were also more sensitive in identity A than identity B. Nonamnesic comparisons did not show a significant change across behavioural tasks, $t(19)$ -.88, $p = .388$.

For Test session 1, groups differed significantly on sensitivity, $F(3, 67) = 4.73$, $p = .005$, $\eta_p^2 = .175$, with Gabriel's post hoc tests indicating that the DID participants scored significantly lower than simulators ($p = .022$), amnesic comparisons ($p = .009$) and nonamnesic comparisons ($p = .011$). Simulators did not differ from amnesic comparisons ($p = 1.000$) or nonamnesic comparisons ($p = 1.000$), nor did the comparison groups differ ($p = 1.000$). For Test session 2, the groups differed, $F(3, 67) = 31.17$, $p < .001$, $\eta_p^2 = .82$, with DID participants demonstrating significantly higher sensitivity than simulators ($p < .001$) and amnesic comparisons ($p < .001$), but significantly lower sensitivity than nonamnesic comparisons ($p < .001$). Simulators and amnesic comparisons demonstrated significantly

lower sensitivity than nonamnesic comparisons ($p < .001$; $p < .001$, respectively), while simulators and amnesic comparisons did not differ significantly ($p = .592$). These results suggest that DID participants, simulators and amnesic comparisons are less sensitive in discriminating between previously experienced stimuli and distractors at behavioural task 2, while nonamnesic comparisons show no difference in sensitivity between behavioural tasks 1 and 2.

Response bias. The mixed measures ANOVA on Test session (set presented first, set presented second) by Group (DID, simulator, amnesic comparison, nonamnesic comparison) indicated a significant main effect for Test session, $F(1, 67) = 293.50$, $p < .001$, $\eta_p^2 = .81$, with greater response bias (i.e., participants were more conservative so less inclined to recognise items) in behavioural task 2 compared to behavioural task 1. The Group main effect was also significant, $F(3, 67) = 41.02$, $p < .001$, $\eta_p^2 = .65$, with DID participants, simulators and amnesic comparisons reporting higher response bias (i.e., more conservative) than nonamnesic comparisons ($p < .001$; $p < .001$; $p < .001$, respectively). The DID participants did not differ from the simulators ($p = .100$) or amnesic comparisons ($p = .518$), nor did the simulators from the amnesic comparisons ($p = .878$). Related to hypothesis two, the Test session x Group interaction was significant, reflecting a difference in response bias between groups across Test sessions, $F(3, 67) = 52.78$, $p < .001$, $\eta_p^2 = .70$. DID participants reported more response bias in behavioural tasks 2 encoded by identity B compared to behavioural tasks 1 encoded by identity A, $t(13)$ -3.37, $p = .005$. Simulators, $t(15)$ -21.03, $p < .001$, and amnesic comparisons, $t(20)$ -20.11, $p < .001$, also reported more response bias in identity B than identity A. Nonamnesic comparisons did not show a significant change across behavioural tasks, $t(19)$ .75, $p = .461$.

For Test session 1, groups showed a trend to differ significantly on response bias, $F(3, 67) = 2.24$, $p = .092$, $\eta_p^2 = .09$. DID participants showed a trend to present more response bias

than amnesic comparisons (p = .083), while all other comparisons were not significant (p > .243). For behavioural task 2, the groups differed, $F(3, 67) = 70.33$, $p < .001$, $\eta_p^2 = .76$, with post hoc tests indicating that DID participants, simulators and amnesic comparisons scored significantly higher response bias than nonamnesic comparisons ($p < .001$; $p < .001$; $p < .001$, respectively). Simulators and amnesic comparisons were also significantly higher on response bias than DID participants ($p < .001$; $p = .001$, respectively), while simulators and amnesic comparisons did not differ significantly ($p = .944$). This suggests that DID participants, simulators and amnesic comparisons were more conservative (i.e., more hesitant to indicate that they recognised sentences to represent events from the behavioural tasks) at behavioural task 2, whereas nonamnesics were more liberal.

Remember and Know Responses

Scores indicating the quality of the recognition are presented in Table 4. The mixed ANOVA for Test session (behavioural tasks presented first, behavioural tasks presented second) by Group (DID, simulator, amnesic comparison, nonamnesic comparison) for remember responses indicated a significant main effect for Test session, $F(1, 67) = 117.76$, $p < .001$, $\eta_p^2 = .64$, indicating that there were more remember responses for Identity A tasks than Identity B tasks. The Group main effect was also significant, $F(3, 67) = 4.19$, $p = .009$, $\eta_p^2 = .16$, with DID participants and simulators reporting significantly lower remember scores than nonamnesic comparisons ($p < .018$; $p < .040$, respectively). Amnesic comparisons reported a trend of lower remember scores than nonamnesic comparisons ($p = 0.78$). DID participants did not differ from simulators ($p = .999$) or amnesic comparisons ($p = .963$), nor did simulators and amnesic comparisons ($p = .999$). Important for the third hypothesis, the Test session x Group interaction was significant, reflecting a difference in remembering between groups across test sessions, $F(3, 67) = 3.662$, $p = .017$, $\eta_p^2 = .14$. DID participants, $t(13)$ 4.17, $p = .001$, simulators, $t(15)$ 8.60, $p < .001$, amnesic comparisons, $t(20)$ 6.58, $p <$

.001, and nonamnesic comparisons, $t(19)$ 3.32, $p = .004$, characterised behavioural task 1 responses more as remember recognitions compared to Behavioural Task 2 (n.b., amnesic comparisons did not receive a second set of behavioural tasks).

A one-way ANOVA on Group for behavioural task 1 remember responses, $F(3, 67) = 3.31$, $p = .025$, $\eta_p^2 = .13$ indicated that the DID participants had significantly lower rates of remembering events they heard in Identity A than simulators ($p = .029$). A trend presented for lower rates of remembering than nonamnesic comparisons ($p = .066$). They were not significantly different to amnesic comparisons ($p < .130$). Simulators did not differ compared with amnesic comparisons ($p = .960$) and nonamnesic comparisons ($p = .997$), nor did the comparison groups ($p = 1.000$).

A one-way ANOVA for Group for behavioural task 2 remember responses also showed a significant effect, $F(3, 67) = 4.04$, $p = .011$, $\eta_p^2 = .15$, with simulators reporting lower remember responses than nonamnesic comparisons ($p = .001$). Amnesic comparisons reported a trend to report less remember responses than nonamnesic comparisons ($p = 0.67$). No other comparisons were significant.

For know responses, the main effect for Test session showed a trend for significance, $F(1, 67) = 3.00$, $p = .091$, $\eta_p^2 = .04$, with more know recognitions for session 1. The group main effect was significant, $F(3, 67) = 7.33$, $p < .001$, $\eta_p^2 = .25$. DID participants reported significantly more know responses across sessions than simulators ($p = .001$), amnesic comparisons ($p <.001$), and nonamnesic comparisons ($p = .003$). Simulators were not significantly different to amnesic comparisons ($p = 1.00$) or nonamnesic comparisons ($p = .999$), nor were amnesic and nonamnesic comparisons ($p = .995$). The Test session x Group interaction was not significant, $F(3, 67) = 1.17$, $p = .329$, $\eta_p^2 = .05$, reflecting that the groups showed similar levels of ‘know’ responses across the two test sessions.

Discussion

The present study assessed the extent of transfer of episodic autobiographical memory across amnesic identities in DID. Subjectively, DID participants reported amnesia for events experienced in their other, amnesic identity. On tests of free recall, DID participants showed a trend to report less memory of stimuli presented to identity B, when tested in identity A (p = .057). Simulators reported a reduction in recall of identity B material. Amnesic comparisons only recalled stimuli that were presented to them, while nonamnesic comparisons showed an increase in memory of the most recently presented stimuli (i.e., behavioural task 2/identity B stimuli; a recency effect). On tests of forced choice recognition, results were similar. DID participants and simulators reported less memory of stimuli presented to identity B, when tested in identity A, while amnesic comparisons showed no recognition of behavioural task 2 stimuli and nonamnesic comparisons showed no difference in memory of both sets of stimuli. DID participants, simulators and amnesic comparisons were more conservative in recognising identity B stimuli than identity A stimuli. Nonamnesic comparisons showed no difference in response bias between both sets of stimuli. On the remember/know paradigm, all groups indicated a reduction in remember responses for identity B material (i.e., amnesic comparisons also showed a reduction in remember responses for material that had not been presented to them). For all participants, no differences in know responses for identity A and B material were found.

Overall recall hit rates indicated that DID and simulator participants reported retrieving fewer memories for the tasks than comparisons. However, whereas for identity A, DID participants recognised significantly less stimuli compared to the other groups, in identity B they recognised significantly more stimuli than simulators and amnesic comparisons, indicating a slightly different pattern of responding between these groups and an indication that the reported amnesia was not complete. Although the DID participants

showed a reduction in recognition of information presented to the amnesic identity, they did not present as great an impairment as seen in groups feigning or exhibiting true amnesia. There was also a reduction in remember responses in DID for stimuli experienced in the amnesic identity (Identity B) compared to stimuli experienced in their own identity (Identity A). In contrast, Huntjens et al. (2003) showed no differences in the number of remember or know responses from identity A and identity B in their assessment of inter-identity transfer of episodic (non-autobiographical) memory. It is noteworthy that in the current study, the DID sample reported significantly more know responses to stimuli seen in their amnesic identity compared to the other groups, indicating their memories are more characterised by noetic compared to autonoetic consciousness. This indicates that memories of autobiographical stimuli encoded in another amnesic identity may be retrieved more from the semantic memory system, associated with noetic consciousness, than the episodic memory system, which is associated with autonoetic consciousness).

The DID participants results were comparable to the amnesic comparison group, who did not receive a second behavioural task and directly contrasted the results of the nonamnesic (true control) group, who showed no detriment in retrieval for identity B tasks (i.e., and even an increase for recall tasks). The simulators, instructed and practised at simulating amnesia, along with the amnesic comparison group, produced results consistent with amnesia (i.e., no recall or recognition of behavioural tasks experienced by identity B for the simulators or not seen at all for the amnesic comparison group). The similar findings of the DID patients, amnesic group, and simulators hinder a clear interpretation of the patient task results. The findings indicate that DID participants exhibit a retrieval profile similar to feigned and genuine amnesic samples in their ability to access episodic, autobiographical memories.

Huntjens et al. (2003) determined that amnesia was not present in DID for episodic memory using measures of interference and intrusions to assess retrieval of word lists of vegetables, animals and furniture. Identities were presented with separate and shared word lists, with their ability to discriminate between the two being no different from control participants who exhibit normal memory processes. The results of the current study contrast these previous findings of inter-identity memory transfer. In comparing the present study results to previous research assessing the transfer of autobiographical memory across identities in DID, the findings are also contrasted. Huntjens et al. (2012) concluded that transfer of autobiographical stimuli occurred on a task using more indirect measures of retrieval (i.e., concealed information task (Huntjens et al., 2012). Importantly, however, both these earlier studies presented tasks that simulators proved unable to feign an amnesia profile on and thus can be considered to be objective measures of inter-identity amnesia. Although it is possible that episodic autobiographical memory is more impervious to transfer than semantic autobiographical memory, more indirect, objective measures of assessment are thus needed to further assess this hypothesis for episodic autobiographic memory.

Simulators also presented poorer memory performance for information presented in identity A than the comparison groups on tests of recall; however, it is likely that the mechanism behind this presentation is different from the deficit presented by the DID group. As DID participants presented similarities in their responding to simulators, this effect may explain the trend for DID participants to present poorer memory for identity A information on the forced choice recognition task. As DID participants presented with significantly higher PTSD symptoms than simulators and comparisons, it is difficult to distinguish whether memory impairment is due to DID or PTSD symptomatology. Future studies should include a PTSD control group to assess whether distinct DID and PTSD memory profiles can be established. In addition, future research should aim to analyse DID and comparison

participants who are matched on education level. Due to some DID participants in the sample having to be excluded from the study, the education levels of the groups presented in this study are not comparable, meaning it is difficult to remove education level as a possible confounding variable.

A limitation of the study was that amnesic comparisons received only one set of behavioural tasks, meaning they may have found it easier to remember their information from the task due to experiencing less cognitive load. Nevertheless, as amnesic comparisons did not report a higher level of memory than nonamnesic comparisons, this may not have had a substantial effect on their memory performance for test session 1. An additional limitation was that DID participants were significantly older than simulators, with older age being implicated as a factor in poorer memory performance (Ward et al., 2015). As DID participants did not differ significantly from simulators on measures of memory performance (free recall and forced choice recognition), this is not thought to have had a role in confounding the results.

The present study provides relevant information about the extent of memory transfer in DID. Results indicate that in line with subjective reports of amnesia, memory transfer for explicitly retrieved episodic autobiographical memories is also impaired, with memories less able to be accessed when they are experienced in a different identity. Although the DID participants and simulators both showed a reduction in recognition of identity B stimuli, DID participants were able to recognise considerably more stimuli. Thus, the profile of responding in these groups does appear to differ. As the results of this study do not clearly distinguish between amnesia and simulation, there is a strong need for more objective measures to be utilised for inter-identity amnesia research.

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Chapter 4

Transfer of episodic self-referential memory across amnesic identities in Dissociative Identity Disorder using the autobiographical Implicit Association Test

Abstract

Individuals with dissociative identity disorder (DID) often report having no access to autobiographical experiences encoded by other identities. This research used the autobiographical Implicit Association Test (aIAT) to determine whether there was transfer of episodic self-referential memory events across amnesic identities. Nineteen DID individuals, 16 DID simulators, and 41 comparison participants (divided into amnesic and nonamnesic groups) engaged with an audio vignette of embarrassing scenarios to produce the experience of episodic self-referential events. Results showed transfer of episodic self-referential memory using the aIAT across identities that reported no conscious awareness of encoded content in DID. These aIAT results in DID patients were similar to the nonamnesic comparison group and the simulator group, and differed from the amnesic comparison group. These results are in line with previous literature showing transfer of memories, but extends this work to episodic self-referential memory.

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Transfer of episodic self-referential memory across amnesic identities in Dissociative Identity Disorder using the autobiographical Implicit Association Test

Dissociative Identity Disorder (DID) is captured by a person experiencing marked disruptions in his or her identity and sense of agency characterised by two or more distinct personality states (American Psychiatric Association, 2013). It is not uncommon for adults with DID to present dissociative identities purporting to hold information about traumatic experiences from the past, or that appear normal save for a lack of affect and the experience of amnesia for previous, particularly traumatic events (Kluft, 2007). Each identity has a unique sense of self, having its own first-person perspective on itself, other identities, other people, and the world (American Psychiatric Association, 2013).

Discussion continues about the etiological factors for DID. Yet, a combination of factors, including chronic physical, emotional, or sexual abuse perpetrated by a caregiving figure, major attachment disruption, genetic determinants (e.g., hypnotisability), and sociocognitive and cultural factors, are argued to facilitate its development (e.g., Dorahy et al., 2014; Lynn, Lilienfeld, Merckelbach, Giesbrecht, & Van der Kloet, 2012).

Two fundamental types of identities can be distinguished based on their function in the person's life: Those that appear avoidant of painful internal experiences (avoidant identities) and those that appear fixated on them (trauma identities; Boon, Steele, & Van der Hart, 2011). Inter-identity amnesia for traumatic events has been reasoned to allow an identity to preserve its sense of self and daily functioning in the face of abuse and neglect (Kluft, 2007). Although an avoidant identity may claim to not have memories for past traumatic events (Lewis, Yeager, Swica, Pincus, & Lewis, 1997), trauma identities report key information regarding these experiences. Inter-identity amnesia has been studied for events holding both traumatic and neutral emotional content (stored in the episodic memory system) as well as for common facts (e.g., general semantic or autobiographical knowledge) stored

separately from a person's experience, in the semantic memory system. More recently, these studies have not found evidence for objective memory retrieval deficits across identities that report amnesia (e.g., Huntjens, Peters, Woertman, Van der Hart, & Postma, 2007; Kong, Allen, & Glisky, 2008). This lack of retrieval deficit was found in both explicit and implicit retrieval tasks (for an extended discussion see Huntjens, Postma, Peters, Woertman, & Van der Hart, 2003). Yet research regarding episodic autobiographical memory transfer in DID is lacking. Although therapists have routinely noted a lack of shared episodic autobiographical memories between identities (Bryant, 1995), the extent and nature of this reported amnesia has not been well assessed experimentally.

Autobiographical memories hold a large amount of person-specific information associated with knowledge about who a person is and the events that have occurred in their life (Conway & Pleydell-Pearce, 2000). One of the few studies assessing autobiographical memory transfer in DID required participants to answer semantic autobiographical memory questions (e.g., favourite food) about themselves in avoidant and traumatic identities (Huntjens, Verschuere, & McNally, 2012). Although the DID group reported amnesia for the answers provided by the other identities and reported a belief that they were unable to access memories from amnesic identities, transfer of autobiographical memory was evident using the Concealed Information Test.

The current study took a step toward examining episodic autobiographical information by assessing episodic self-referential information across identities in DID patients reporting amnesia in a controlled setting. Self-referential encoding processes information "as strongly related to one's own experience" (Northoff et al., 2006, p. 441; e.g., I had this experience), and is retrieved more accurately than information not self-referentially encoded (Symons & Johnson, 1997). The autobiographical Implicit Association Test (aIAT) was utilised for this study. The aIAT uses reaction time (RT) data to assess which of two

autobiographical or self-referential statements (e.g., I was drunk vs I was sober) is true (Verschuere, Prati, & De Houwer, 2009). It does so by examining the ease of pairing the statements with the labels true and false. When pairing a statement with true (and pairing its counterpart with false) is faster than pairing that statement with false (and pairing its counterpart with true), the statement is more likely to be correct than its counterpart. Meta-analytic research supports its validity, with Cohen's *d* 0.82 [0.54; 1.11], in naïve (i.e., non-faking) participants, implying that RTs allow for assessing which of the two statements presented in the aIAT is most likely true (Suchotzki, Verschuere, Van Bockstaele, Ben-Shakhar, & Crombez, 2017).

In the current study, we aim to determine whether memory transfer across reported amnesic DID identities was evident for episodic self-referential information using the aIAT. Two vignettes detailing embarrassing scenarios were used. Four samples were assessed. DID participants heard a different vignette in each identity. To address the suggestion that DID may be a disorder of simulation and as such, simulator groups should be utilised for comparison purposes (Boysen & VanBergen, 2014), we also included a DID simulator sample consisting of professional and amateur actors instructed to simulate inter-identity amnesia. The same procedure was used for the DID and DID simulator samples. One additional nonclinical nonamnesic comparison sample heard both vignettes, and acted as a true control group, while another heard only one vignette to act as a true amnesia group. In line with previous research showing that inter-identity amnesia in DID may be more a perceived deficit than an objective retrieval impairment, it was hypothesised that the vignette material of both identities would be as easily paired with the "true" category in the aIAT (i.e., no objective amnesia).

Method

Participants

DID. Nineteen DID participants were recruited from a hospital programme in Australia specialising in trauma and dissociative disorders and from referrals via clinicians. Inclusion criteria involved, (a) a DID diagnosis by treating clinician; (b) a confirmation of DID diagnosis by the researcher using the DID section of Dissociative Disorders Interview Schedule (DDIS; Ross et al., 1989); (c) the capacity to engage two identities to take part who reported prior to the commencement of the study no knowledge of events that occur in the other identity (i.e., two-way between-identity amnesia); (d) having one participating identity who had more awareness of distressing events from the past and the other participating identity having less awareness of such events; (e) being able to switch between these two identities on request; and (f) chosen identities having the ability to read and write. Exclusion criteria involved: (a) Not being able to concentrate on the computer task due to intensity of psychiatric symptoms as judged by their treating psychiatrist; (b) being unable to initiate switching between identities or maintain an identity in executive control, and (c) not reporting amnesia between their chosen identities. All 19 DID participants were female. Participants were told the study would research memory in different identities of people with DID. Participants self-selected the two identities and received a $20 shopping voucher for taking part in the study. Seven DID participants were removed for failing to complete the task (n = 1), being unable to switch between identities (n = 3), or experiencing test interference from a third identity (n = 3). The final DID sample contained 12 participants.

Comparisons. Forty-one comparison participants took part in the study. These were undergraduate psychology students (n = 15) and members of the general population of New Zealand and Australia (n = 26) recruited via group e-mail, notice board flyer, or word of mouth. Comparison participants reported no memory or attentional deficits and were

randomly assigned to an amnesic group (n = 21) or a nonamnesic group (n = 20). Participants in the amnesic group received the memory stimuli given to the first identity (Identity A) in the DID group (see Procedure), and participants in the nonamnesic group received the memory stimuli given to both DID identities. Comparison participants were not aware the study was researching DID and were informed it assessed how old and new memories were influenced by a person's cognitive functioning. They received $20 in shopping vouchers for participating in the research, or course credit.

Simulators. Sixteen DID simulator participants took part in the study. These were professional and amateur actors from a university theatre and film department in New Zealand, and various theatre companies via word of mouth and snowball sampling. Table 1 shows the demographics details for each group.

Stimuli

Vignettes. Vignettes were adapted for the study based on previous research that used stories to elicit emotion in a laboratory context in clinical and nonclinical participants (Dorahy et al., 2017). The vignettes were 14 sentences long. Two vignettes contained embarrassing emotional content (i.e., a bank teller pointing out mucus on your face while others mock; being berated in a supermarket for hitting a child with your trolley). We used vignettes with embarrassing content to introduce emotional stimuli while avoiding a task too taxing to complete, especially for the DID participants. One embarrassment vignette was administered to each identity (i.e., bank or supermarket)[6].

[6] Neutral vignettes were also presented but were not assessed by the aIAT, which focused on emotional events.

Table 1

Participant Demographic Data across Groups

	DID (*n* = 12)	Simulator (*n* = 16)	Amnesic Control (*n* = 21)	Nonamnesic Control (*n* = 20)
Age *M (SD)*	39.17 *(11.74)*	31.38 (*15.16*)	39.10 (*8.70*)	38.35 (*7.24*)
Sex *n* (%)				
Male	0 (0%)	2 (12.5%)	1 (4.8%)	1 (5%)
Female	12 (100%)	14 (87.5%)	20 (95.2%)	19 (95%)
Ethnicity*				
New Zealand European	0 (0%)	13 (81.3%)	11 (52.4%)	16 (80%)
Māori	0 (0%)	0 (6.3%)	0 (0%)	0 (0%)
Australian European	10 (83%)	2 (12.5%)	1 (4.8%)	0 (0%)
Other	4 (33%)	1 (12.5%)	9 (42.9%)	4 (20%)
Qualification§				
High school certificate	4 (33.3%)	5 (31.2%)	2 (9.5%)	0 (0%)
Post-high school non-university (e.g. Trade certificate)	1 (8.3%)	2 (12.5%)	8 (38.1%)	9 (45%)
University level	5 (41.7%)	9 (56.3%)	11 (52.4%)	11 (55%)

* For the dissociative identity disorder (DID) group, two participants chose two ethnicities. § For the DID group, two participants reported no qualifications.

aIAT. The aIAT measured episodic self-referential memory for the content presented in the vignettes: "I had mucus on my face in the bank" (Bank vignette) versus "I hit a child with my trolley in the supermarket" (Supermarket vignette). It does so by examining the ease of pairing the statements with the labels true and false. When pairing the bank statement with true (and the supermarket statement with false), RTs are faster than pairing the bank statement with false (and supermarket statement with true), indicating the bank statement is

more likely to be true for the participant than the supermarket statement. Examples of the stimuli and procedure are presented in Table 2. The task was presented using Inquisit Software, which recorded RTs with millisecond accuracy (De Clercq, Crombez, Buysse, & Roeyers, 2003). Participants are instructed to accurately categorise the sentences. In Block 1, participants are presented only with the true and false sentences. The labels TRUE and FALSE are depicted in the left and right (respectively) corners of the screen. Participants are instructed to categorise true sentences as TRUE (by pressing the E key) and false sentences as FALSE (by pressing the I key). In Block 2, participants are presented only with the vignette attributes, and participants classify the sentences as belonging either to the bank vignette (I HAD MUCUS ON MY FACE IN THE BANK) or to the supermarket vignette (I HIT A CHILD WITH MY TROLLY IN THE SUPERMARKET). Assignment of response buttons to vignettes was counterbalanced across participants. Block 3 practices for Block 4, and consists of a combined block in which participants have to classify both true versus false sentences and sentences from both vignettes (i.e., with labels referring to both classifications appearing in the corners of the screen). Participants are instructed to categorise the sentences as they did in Blocks 1–2. In Block 5, participants are again only presented with vignette sentences, but the order of the vignette attributes is reversed to what it was in Block 2 (e.g., when bank label was left and, supermarket right in Block 2; Block 5 has bank label right, and supermarket left). The latter order is then also used in the last two combined blocks, with Block 6 practising for Block 7 (e.g., bank and false; supermarket and true).

Procedure

The study was part of a larger experiment on memory transfer in DID approved by the relevant IRBs. Participants in the simulator group were instructed how to simulate DID via various means. Participants were shown a video outlining DID, which provided information to aid simulation. The video was 8.27 minutes long and consisted of clips from two

documentaries “Multiple Personality Disorder: The Search for Deadly Memories” (Moss, Nevins, & Mierendorf, 1993) and the trailer of “When the Devil Knocks” (Harper, Palmer, & Slinger, 2010). A DID Information Sheet was also provided for education and consisted of three pages of information outlining DID and answering frequently asked questions (e.g., is it obvious when a person switches identities, what are the symptoms of DID?). DSM-5 criteria for the disorder were also included. The information sheet was adapted from the Sidran Foundation by members of the research team (MJD, CB). After watching the video on DID, and being administered the DID information sheet, participants were given information on character development by a professional acting instructor (Dr Greta Bond). An identity/character description sheet was then administered which allowed participants to fill out 18 questions about their created identity (e.g., age, height, hair colour, interests, personality style). Simulators created an identity that was amnesic for the content shown to the other identity. They were also educated in how to mimic DID which included practice instructions on how to create and switch between identities. They practised their created identity for one-to-two weeks and completing a practice log book for the amount of practice they engaged in daily, amassing an average of 153.75 minutes of practice (*SD* = 93.47). Participants were then required to pass a DID knowledge test and record their motivation levels for practising and simulating DID on a scale ranging from “not at all” to “completely”. Simulators were instructed to simulate amnesia between their identities throughout the study. Written and informed consent was gained from all participants and identities before participation. All participants were tested individually by the first author. Participants were randomly assigned to vignette conditions (bank or supermarket). DID and simulator participants were assigned the bank vignettes in one identity and supermarket vignettes in the other identity. Presentation order of vignettes and order of DID/simulator identity was counterbalanced over all participants. Amnesic comparisons were randomly assigned one

vignette. Nonamnesic comparisons were assigned both pairs of vignettes, and the presentation order was again counterbalanced across participants. Participants were instructed to become as absorbed in the vignette as possible and remember any details they could. During the vignette presentation, participants were required to say aloud the sentence they had just heard via headphones, changing it from the personal pronoun "you" (e.g., you went to the bank) to "I" (e.g., I went to the bank) to heighten its self-referential quality. After each vignette had finished, participants rated the level of embarrassment experienced on a scale from 0 (not at all) to 100 (completely) and were asked to recall as many details of the story as possible in two minutes. After switching to the other identity (Identity B), DID and simulator participants were asked if they remembered anything about what had just happened in the study to assess for subjective inter-identity amnesia (all responded having no awareness). The second vignette was given to this identity (or to participants in the nonamnesic comparison group), and they followed the same procedure as Identity A. Comparison participants were also asked what they remembered after completing the vignette (amnesic) or after each set of the vignettes (nonamnesic). Approximately five minutes after hearing their last vignette, participants engaged in the aIAT. They were instructed to categorise the sentences as quickly as they could while minimising errors. The DID and simulators completed the aIAT in the identity that heard the first vignette (Identity A). The researcher who engaged in data collection (RM) was blind to who was in the DID and simulator groups, and simulators were instructed to ensure the researcher believed they had a DID diagnosis (i.e., they did not break role). After blindly testing each simulator and DID participant, the researcher completed a survey assessing whether the participant appeared to authentically have DID. All but three simulators were rated as authentic.

Table 2

Structure of the autobiographical Implicit Association Test (aIAT) with example stimuli

Block number	Left label	Right label	Example stimulus (category)	Number of trials
1	TRUE	FALSE	"I am sitting at a computer" (true); "I am sitting by a television" (false)	20
2	I HAD MUCUS ON MY FACE IN THE BANK	I HIT A CHILD WITH MY TROLLY IN THE SUPERMARKET	"I went to the bank" (bank); "I went to the supermarket" (supermarket)	20
3-4	I HAD MUCUS ON MY FACE IN THE BANK or TRUE	I HIT A CHILD WITH MY TROLLY IN THE SUPERMARKET or FALSE	"I am sitting by a television" (false); "I am sitting at a computer" (true); "I went to the bank" (bank); "I went to the supermarket" (supermarket)	20 (practice) + 40 (test)
5	I HIT A CHILD WITH MY TROLLY IN THE SUPERMARKET	I HAD MUCUS ON MY FACE IN THE BANK	"I went to the bank" (bank); "I went to the supermarket" (supermarket)	40
6-7	I HIT A CHILD WITH MY TROLLY IN THE SUPERMARKET or TRUE	I HAD MUCUS ON MY FACE IN THE BANK or FALSE	"I am sitting by a television" (false); "I am sitting at a computer" (true); "I went to the bank" (bank); "I went to the supermarket" (supermarket)	20 (practice) + 40 (test)

Data Reduction

The aIAT was scored using Greenwald, Nosek, and Banaji's (2003) improved scoring algorithm. Trials with RTs greater than 10 seconds were deleted leading to the exclusion of 1.4% of data. There were no participants that needed to be excluded for having more than 10% trials 300 ms. The D score is calculated using the difference between the mean response latencies in the incongruent combined Blocks (e.g., bank and true; supermarket and false) minus the congruent versus combined Blocks (supermarket and true; bank and false) and dividing it by their pooled standard deviation, making it roughly equivalent to Cohen's *d*. D scores that do not significantly differ from zero suggest that both events were in memory during retrieval and considered to be true. A significant positive D score indicated that identities were more likely to classify their experienced vignettes as being true compared to the events experienced in the other identity (which would support the presence of inter-identity amnesia). aIAT analyses were conducted by the fourth author (BV), who was blind to which sample each participant belonged.

Results

There were no significant group differences in gender, χ^2 (3) = 2.12, p = .55, *Cramer's V* = .18, age, $F(3, 65) = 2.00$, $p = 0.12$, $\eta_p^2 = .09$, or education level, χ^2 (6) = 10.63, p = .10, *Cramer's V* = .40 (broken down into high school; post-high school, non-university; university).

Comparing the bank vignette ratings, the groups differed significantly, $F(3, 55) = 3.52$, $p = 0.021$, $\eta_p^2 = .16$, with Gabriel's post-hoc tests indicating that DID participants (M =70.83; SD = 35.02) rated the vignette close to significantly (p = .057) more embarrassing than the amnesic comparisons (M = 31.82; SD = 35.73), and significantly more embarrassing (p = .022) than the nonamnesic comparisons (M = 32.50; SD = 32.91). The difference between DID participants and simulators (M = 42.50; SD = 36.79) was not significant (p =

.20), nor were the other comparisons ($p > .95$). Comparing the supermarket vignette ratings, the groups also differed significantly, $F(3, 54) = 3.85$, $p = 0.014$, $\eta_p^2 = .18$, with Gabriel's post-hoc tests indicating that DID participants ($M = 65.00$; $SD = 31.48$, $p = .047$) but not simulators ($M = 60.00$; $SD = 31.41$, $p = .086$), rated the vignette as more embarrassing compared to nonamnesic comparisons ($M = 33.00$; $SD = 30.97$). All other comparisons were not significant ($p > .18$).

Table 3 shows the D scores and their significance for each group. Nonamnesic comparison participants had aIAT scores that did not differ from zero; in other words, the aIAT correctly concludes that they subjectively experienced both embarrassing events to be true. Amnesic comparison participants had a significantly positive aIAT score; in other words, the aIAT correctly recognised that they had experienced only one of the two events. Thus, these results validate the aIAT methodology and allow interpretation of DID participants and simulators scores. DID participants had an aIAT score that did not differ from zero, meaning the events experienced by Identity A were not considered to be more true than events occurring in Identity B. Simulators similarly were found to classify both events (i.e., those experienced by Identity A & B) as equally likely to be true. The simulators' aIAT score was slightly positive (which hints at successful faking of amnesia), but the score did not differ significantly from zero ($p = .07$).

Table 3.

D scores (with SD) for autobiographical Implicit Association Test (aIAT)

Diagnostic group	aIAT D score (*SD*)	*p*-value one sample t-test against zero (with Cohen´s *d*)	Bayes factor (BF_{10})
DID (*n*=12)	+.13 (.43)	.32 (.30)	0.45 (anecdotal evidence for aIAT=0)
Simulator (*n*=16)	+.26 (.53)	.07 (.49)	1.17 (anecdotal evidence that aIAT score differs from 0)
Amnesic Comparison (*n*=21)	+.49 (.48)	.001 (1.02)	190 (extreme evidence that aIAT score differs from 0)
Nonamnesic Comparison (*n*=20)	+.02 (.38)	.78 (.06)	0.24 (moderate evidence for aIAT=0)

Note. The Bayes factor for the one-sample t-test against zero, calculated with JASP (https://jasp-stats.org) and the Cauchy prior width set to JASP default *r*= 0.707, indicates how much more likely the data are under the alternative hypothesis (aIAT differs from zero) than under the null hypothesis (aIAT is zero). Interpretation of Bayes factor following Lee and Wagenmakers (2013).

These findings were confirmed by a significant one-way between-subjects ANOVA on Group (DID, simulator, amnesic comparison, nonamnesic comparison), $F(3, 65) = 3.79$, $p = 0.014$, $\eta_p^2 = .15$. An independent t-test showed a large difference in aIAT scores between the amnesic comparison group and the nonamnesic comparison group, $t(39) = 3.42$, $p < .01$, Cohen´s $d = 1.08$ (95% CI: 0.43; 1.74), confirming the aIAT methodology. The aIAT D score of the DID patients differed significantly from that of the amnesic comparison group, $t(31) =$

2.15, p = .04, Cohen´s d = 0.78 (95% CI: 0.04; 1.51), but did not differ significantly from the nonamnesic comparison group, $t(30)$ = 0.72, p = .47, Cohen´s d = 0.28 (95% CI: -0.44; 0.99 or the simulators, $t(26)$ = 0.70, p = .49, Cohen´s d = -0.26 (95% CI: -1.02; 0.49). These results were complemented with Bayesian statistics (see Table 3), providing additional results rendering a conclusion of anecdotal evidence for no amnesia in the DID sample and amnesia for the simulators.

Discussion

This study was unique in examining transfer of episodic self-referential memory across different self-reported amnesic identities in DID. Results in the comparison groups confirmed the aIAT methodology as the aIAT could discriminate the comparison group who were amnesic for one event (i.e., had not experienced one of the embarrassing events) from the comparison group who were not amnesic (i.e., had experienced both embarrassing events). The aIAT results of the DID participants indicated they had episodic memory of both events; in other words, the tested identity did not discriminate between the event experienced in the same versus another identity, so that both were considered to be true. The results of the DID patients were similar to nonamnesic comparisons and simulators.

The DID trauma model indicates that traumatic events are experienced by trauma identities and kept separate from avoidant identities who have a role in preserving functioning in day-to-day tasks by inter-identity amnesia. By compartmentalising these events so they are separated from avoidant identities, integration with other identity-specific memories cannot occur, further perpetuating the existence of separate identities. Results indicate, however that retrieval for episodic self-referential memories with embarrassing emotional content was evident in both traumatic and avoidant identities. These results are in line with previous research showing that stimuli can transfer between identities despite full

amnesia being reported (e.g., Huntjens et al., 2007; Huntjens et al., 2003; Huntjens et al., 2012).

Thus, information is subjectively reported to be irretrievable but objectively retrieved. There are several possible explanations for these findings. First, patients were consciously simulating amnesia resulting in self-reports of amnesia but transfer of information between identities. No firm conclusions can be drawn about this possibility, as DID patients did not differ from nonamnesic controls nor from simulators. The Bayes factors, however indicated anecdotal evidence for the simulator aIAT scores differing from 0 (indicating amnesia). The DID aIAT results indicated anecdotal evidence against amnesia, rendering this possibility less likely. Second, the patient results are determined by metacognitive beliefs of being unable to retrieve past events experienced in another identity with the accompanying alternative self-concept. The patient's subjective perception of the self as fragmented may result in the motivation not to engage in search of the autobiographical memory base or not acknowledge retrieved material if this is deemed ego-dystonic to the current personality state (e.g., adult activities in a child personality state). These metacognitive beliefs may have resulted in self-reports of inter-identity amnesia, although the capacity to engage in searching past experience was unaltered. Future work should investigate the content and role of metacognitive beliefs in memory retrieval and identity reconstruction in DID (Huntjens & Dorahy, 2018). Clinically, amnesia in DID may result from metacognitive rather than cognitive processes. Thus, a metacognitive focus in therapy may assist in overcoming subjective identity fragmentation and subjective compartmentalisation of information.

This research was limited by quite small sample sizes, although effect sizes indicated medium to large effects. Generalisations from this laboratory study should be limited to those participants with DID who have been in therapy for some time, who are aware they have identities that have different experiences and different first-person perspectives, who can

move between these identities on command from a researcher or their therapist, and who have the mental energy and cognitive faculties to complete a very complex task. This grouping of DID participants is unlikely to reflect those not seeking treatment or those in the early stages of therapy. Further caution should be exercised in overgeneralising from the analogy procedure and embarrassment-laden content used here to genuine and more intense and distressing experiences often reported in those with DID. Future studies should utilise autobiographical experience to assess the validity of the current findings.

In summary, DID participants demonstrated transfer of episodic memories across identities that claimed to have no knowledge of events that occurred in the other identity. Health practitioners may seek to use these findings to understand further the connection between identities, such that amnesic identities may have access to the experiences of other identities, although at this stage it is unclear why patients subjectively report having no awareness of these experiences (i.e., amnesia) and do not always wilfully engage in retrieval of events experienced in other identities. The latter may reflect a general habitual strategy influenced by the motivation not to acknowledge or take ownership of events that threaten that identity's subjective self-coherence. The discrepancy between the ability to retrieve experiences on the one hand and the inability to take ownership of what is retrieved, on the other hand, requires further attention.

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Chapter 5

Meaning-Making of self-defining memories in Dissociative Identity Disorder

Abstract

Individuals with dissociative identity disorder (DID) often report a fragmented sense of self. Essential for the development of an integrated sense of self is the process of meaning making, which supports the integration of autobiographical memories into a person's self-concept. In this experiment, a self-defining memory task was used to assess meaning-making in adult and child DID identities. Fourteen DID participants, 25 adult comparisons, 26 child comparisons, 23 child simulators and 19 clinical comparisons with a psychotic disorder were recruited. They were asked to select three self-defining autobiographical memories and complete a questionnaire assessing the emotional valence for each memory and reported meaning making for the self-defining memories. DID adult and child identities reported comparable memory valence. Yet, DID child identities indicated the use of less meaning-making than DID adult identities, with both groups being comparable to their age matched comparisons. Comparable performance of the child simulators with the DID child identities hinders unequivocal interpretation of the results. Although these results appear to support less ability in meaning making in the DID child identities, the use of a more objective assessment of meaning making ability is required.

Meaning-Making of self-defining memories in Dissociative Identity Disorder

Autobiographical memories play a crucial role in the development of the sense of self, the perception of who we are as a person. Illustrative of this central link are so-called self-defining memories, referring to important memories about one's personal life that involve strong feelings, are very familiar and help to understand what kind of individual a person is. People who successfully integrate these self-defining memories into their life story experience their identity as continuous and coherent over time, despite the vast changes their sense of self is likely to have undergone throughout its development (Jørgensen et al., 2012; Lampinen, Odegard, & Leding, 2004). But not all people are characterised by a continuous, integrated sense of self. For example, the condition Dissociative Identity Disorder (DID) is characterised by a lack of integration of the self. More specifically, patients with DID report the experience of two or more personality states that each report their own individual sense of agency and way of perceiving the world (American Psychiatric Association, 2013). The prevalence of DID is reported as between 1% and 4% of the general population (Johnson, Cohen, Kasen, & Brook, 2006; Loewenstein, 1994; Şar, Tutkun, Alyanak, Bakim, & Baral, 2000) and 1% and 12% of clinical populations (Boon & Draijer, 1993; Foote, Smolin, Kaplan, Legatt, & Lipschitz, 2006; Horen, Leichner, & Lawson, 1995; Kluft, 1999; Latz, Kramer, & Hughes, 1995; Ross, Anderson, Fleisher, & Norton, 1991; Şar, 2011; Saxe et al., 1993). Research supports a link between development of the disorder and reported traumatic childhood events, particularly abuse perpetrated by a caregiver (Dalenberg et al., 2012; Dorahy et al., 2014; Loewenstein, 2018; Loewenstein, Frewen, & Lewis-Fernández, 2017; Nijenhuis, Van der Hart, & Steele, 2010). The posttraumatic model of DID states that as children experience ambivalent feelings of fear of their abuser and a need to seek comfort and safety from them, different identities develop as a way to cope with the abuse and the internal conflict it causes (Dorahy et al., 2014; Kluft, 1999; Price, 1993).

Previous literature in this field indicated that despite the reported separation in sense of self between identities, the content of self-defining memories retrieved by identities is comparable, at least with regard to traumatic content. Huntjens et al. (2016) found that despite discrepancies in the presentation of identities as either trauma-oriented or trauma-avoidant, there were no differences in the self-reported levels of traumatic content in either identities' self-defining memories. That is, the DID patients did not seem to be "shut off" from their trauma in their avoidant identity state.

However, the process of meaning-making of self-defining memories for each identity was not assessed in previous studies. Meaning-making supports the integration of memories into a person's sense of self, and especially for memories with a negative emotional valence, acts to reduce the negative emotional content (McLean & Thorne, 2003). Those who engage in meaning-making actively consider the significance of events for their personal growth, which allows them to gain insight into how these events have impacted who they are at present and how the events have altered their perception of other areas of their life (McLean, 2005; Wood & Conway, 2006). This process also allows people to gain more personal meaning in their life and consider the life lessons which have been used to guide their behaviour in subsequent comparable settings (Blagov & Singer, 2004; McLean, 2005; McLean & Thorne, 2003). The literature indicates that the ability to engage in meaning-making tends to develop in adolescence (McLean & Thorne, 2003; Thorne, McLean, & Lawrence, 2004), as a result of advancement in the ability to engage abstract thinking (McLean & Thorne, 2003). In the context of DID, this process may be impaired, and the disorder may be associated with a lack of meaning making. More specifically, impaired meaning making may both be a precursor for the development of different identities or a maintenance factor of identity fragmentation. That is, less inclination to use meaning making to realise the impact and significance of traumatic events and integrate these experiences into

the life story and sense of self may result in identity fragmentation or may prevent the development of an integrated identity.

The aim of the current study was to explore whether the process of meaning-making is intact across dissociative identities, and whether they differ in the emotional valence of self-defining memories. The current study, in extending the exploration of potential differences in self-defining memories, used both adult and child identities. DID is typically constructed of identities that report differences in age, with some researchers theorising that child identities do not grow older or develop adult characteristics (Putnam, 1997). The child states are considered to be the result of a "structural" breakdown in the natural progression towards integration of discrete behavioural states in childhood; the child identity becomes fixated in time and development and does not experience mental growth since the time of traumatization (Van der Hart, Nijenhuis, & Steele, 2006). If DID child identities stay at the age they are when they develop, they are likely to be unable to develop the ability to engage meaning-making. To further compare whether DID identities develop meaning-making, comparison samples were included in this study. Comparison groups of non-clinical adults and children were included to compare DID identities to groups experiencing a more typical development of their memory processes. A group of child simulators who as adults completed the study as children, were also included to compare DID child identities to a group who share their biological age but merely present as children. This group was added given that proponents of the so-called sociocognitive model of DID state that the disorder is developed when highly suggestible people are exposed to social influence from therapists and the media, rather than traumatic experiences in childhood (Giesbrecht, Lynn, Lilienfeld, & Merckelbach, 2008; Piper & Merskey, 2004a; Piper & Merskey, 2004b; Spanos, 1994). Finally, the present research included a clinical comparison group of participants with psychosis. People who develop psychosis present some similarities with DID including often

reporting childhood experiences of abuse and neglect, albeit, less severe than those with DID (Renard et al., 2017; Scott, Ross, Dorahy, Read, & Schäfer, 2019). In addition, patients of both diagnoses report hallucinatory experience (Longden, Moskowitz, Dorahy, & Perona-Garcelán, 2019). Previous work has yielded mixed results about the abilities of people with psychosis to engage meaning-making. Although Berna et al. (2016) presented evidence of individuals with attenuated psychotic symptoms reporting meaning-making for their self-defining memories, Raffard et al. (2010) indicated a poorer ability for patients with schizophrenia to do so compared to the general population (Raffard et al., 2010).

Based on the posttraumatic model and previous research, the current study tested the following three hypotheses: (1) DID child identities will be likely to report increased negative valence for self-defining memories and will be less likely to report the use of meaning making than DID adult identities; (2) DID child identities will exhibit similar levels of meaning-making as child comparisons; (3) DID adult identities and psychosis clinical comparisons will exhibit impaired levels of meaning-making compared to healthy adult comparisons.

Method

Participants

DID sample. Fourteen DID participants were recruited from a dedicated hospital-based programme in Australia and referrals via clinicians. The target sample size was 20, with this number selected as an attempt to exceed the samples of pre-existing studies researching self-defining memories in DID (Huntjens et al., 2016, $n = 11$). Clinicians referring to the hospital and those known to work with DID patients were sent details of the study and invitation letters to pass on to DID patients whom they felt were stable enough to receive the information. Nurses also gave the invitation letter to DID patients involved with hospital programmes. Inclusion criteria were, (1) a pre-existing diagnosis of DID; (2) a

confirmation of this DID diagnosis via the main researcher administering the DID section of the Dissociative Disorders Interview Schedule (DDIS; Ross et al., 1989); (3) the ability to engage two identities, one that identified as an adult and one identifying as a child (aged between 6 and 12); and (4) the ability to switch between these two identities on request. Along with a diagnosis of DID, participants reported co-morbid diagnoses of posttraumatic stress disorder (PTSD) (*n* = 12), an anxiety disorder (*n* = 11), a mood disorder (*n* = 10), a personality disorder (*n* = 4), ADHD (*n* = 3), obsessive compulsive disorder (OCD) (*n* =3), an eating disorder (*n* = 2), autism (*n* = 1), and a somatic symptoms disorder (*n* = 1). Participants were excluded if they, (1) were too psychiatrically unwell to concentrate on the tasks, (2) were unable to switch between identities or (3) retain one identity in executive control. Participants were told that the study would examine how sense of self is constructed in people with DID. Participants received a $20 shopping voucher for their participation.

Adult comparisons. Twenty-six non-clinical comparison participants took part in the study. These participants were undergraduate psychology students recruited via; (1) a participant research pool (n = 4) and (2) advertisements placed around a psychology department (n = 21); and members of the general public of Christchurch and Brisbane recruited by snowball sampling (*n* = 1) to match the mean age of DID participants. Participants were excluded if they indicated a diagnosis of DID, psychosis or PTSD. Of the 26 comparison participants, one was removed due to a pre-existing diagnosis of PTSD. Comparison participants reported no memory or attentional deficits as asked by the researcher. Control participants were told the aim of the study was to measure sense of self in different groups of people. They were not aware that the study was researching DID. Participants received a $10 shopping voucher for their participation.

Child comparisons. Twenty-six child comparison participants aged between six and twelve took part in the study. These were school children recruited via correspondence with

primary schools in Christchurch, New Zealand. Child comparison participants reported no memory or attentional deficits as assessed by single item measures targeting these domains (see Appendix D-8). Child comparison participants and their guardians were not aware that the study was researching DID. Participants received $10 in shopping vouchers for participating in the research.

Child simulators. Twenty-three child simulator participants took part in the study. These were undergraduate psychology students recruited via; (1) a participant research pool (n = 4); and (2) advertisements placed around a psychology department (n = 19); and members of the general population of Christchurch, recruited via snowball sampling so as to match the mean age of DID adult identities. Child simulators reported no memory or attentional deficits as assessed by single item measures targeting these domains (see Appendix D-8). Child simulators were not aware the study was investigating DID. Participants received $10 in shopping vouchers for participating in the research.

Psychosis clinical comparisons. Nineteen psychosis comparisons took part in the study. The target sample size was 20 to match the DID patient sample number. These participants were outpatients at three dedicated hospital and community-based treatment programmes for psychosis. The inclusion criterion was, (1) a pre-existing diagnosis of psychosis, with (2) confirmation of the disorder verified via a shortened version of the Mini International Neuropsychiatric Interview (MINI) administered by one of the researchers. Clinicians were asked to consider patients on their caseload who may meet the study criteria and to pass on information letters about the experiment. Along with a diagnosis of psychosis, participants reported co-morbid diagnoses of a mood disorder (n = 11), PTSD (n = 3), an anxiety disorder (n = 4), autism (n = 1), substance use disorder (n = 1) and OCD (n = 1). Participants were excluded if they were too psychiatrically unwell to engage with the tasks.

Participants were told the study would assess how sense of self is constructed in people experiencing psychosis and were given a $20 shopping voucher for their participation.

Table 1 displays the demographic details for each sample. The groups differed significantly for age, $F(5, 114) = 69.45$, $p = .000$, $\eta_p^2 = .75$, with post-hoc Gabriel's tests indicating that DID adult identities presenting as significantly older than DID child identities ($p < .001$), child comparisons ($p < .001$) and psychosis clinical comparisons ($p < .001$). There was also a trend for them to be significantly older than the adult child simulators ($p = .095$). DID adult identities did not differ significantly from adult comparisons ($p = .724$). DID child identities did not differ significantly from child comparisons ($p = 1.000$) but were significantly younger than adult comparisons ($p < .001$), child simulators ($p < .001$) and psychosis clinical comparisons ($p <. 001$). Adult comparisons were significantly older than child comparisons ($p < .001$) and psychosis clinical comparisons ($p = .029$). They did not differ significantly from child simulators ($p = .973$). Child comparisons were significantly younger than child simulators ($p < .001$) and psychosis clinical comparisons ($p < .001$). Child simulators did not differ significantly in age to psychosis comparisons ($p = .540$). There were variations in gender for psychosis participants compared to DID, and adult and child comparisons, with more males being present in the psychosis sample than the other samples. Due to the low cell count for males across DID and non-clinical comparison groups, inferential statistics were not conducted. Comparative analysis was also not utilised for ethnicity and education due to low counts.

Dissociative experiences as measured by the Dissociative Experiences Scale (DES) for DID participants, adult comparisons and psychosis clinical comparisons differed significantly across groups. DID participants ($M = 61.05$, $SE = 14.77$) scored significantly higher than psychosis clinical comparisons ($M = 14.30$, $SE = 10.86$; $p < .001$) and adult comparisons ($M = 9.34$, $SE = 8.60$; $p < .001$), $F(2, 55) = 107.65$, $p < .001$, $\eta_p^2 = .80$.

Psychosis clinical comparisons and non-clinical comparisons did not present a significant difference (p = .372). Child comparisons and child simulators differed on dissociative experiences as measured by the Child Dissociative Checklist (CDC), $F(1, 42) = 7.15$, p = .011, $\eta_p^2 = .15$, with child simulators showing more dissociation (M = 6.65, SE = 6.54) than child comparisons (M = 2.48, SE = 3.03).

All DID participants (n = 14) had their diagnosis confirmed by the DDIS. All psychosis participants (n = 19) had their diagnosis confirmed by the MINI and all adult comparisons, child comparisons and child simulators were confirmed not to have psychosis. Psychosis experiences differed across groups, $F(3, 72) = 38.24$, $p < .001$, $\eta_p^2 = .61$. DID participants (M = 3.64, SE = 1.65) and psychosis clinical comparisons (M = 4.63, SE = 2.03) scored significantly higher than adult comparisons (M = .00, SE = .00; $p < .001$; $p < .001$, respectively) and child comparisons (M = 1.14, SE = 1.74; $p < .001$; $p < .001$), but did not differ from each other (p = .162). Adult comparisons showed a trend to report significantly less psychosis experiences than child comparisons (p = .098).

Table 1

Participant Demographic Data across Groups

	DID Adult Identity (n = 14)	DID Child Identity (n = 14)	Adult Comparisons (n = 25)	Child Comparisons (n = 26)	Child Simulators (n = 23)	Psychosis Clinical Comparisons (n = 19)
Age *M* (*SD*)	45.57 (*8.47*)	8.92 (*2.18*)	40.76 (*10.45*)	9.5 (*2.06*)	37.78 (*6.42*)	32.68 (*11.92*)
Sex *n* (*%*)						
Male	2 (14%)	1 (7%)	3 (12%)	3 (12%)	5 (22%)	13 (68%)
Female	12 (86%)	13 (93%)	22 (88%)	23 (87%)	18 (78%)	6 (32%)
Ethnicity						
New Zealand European	4 (29%)	-	13 (52%)	12 (50%)	8 (50%)	14 (74%)
Māori	0 (0%)	-	0 (0%)	2 (8%)	2 (9%)	2 (11%)
Australian European	6 (43%)	-	1 (4%)	1 (4%)	1 (4%)	0 (0%)

Other	11 (79%)	-	11 (44%)	13 (50%)	13 (57%)	4 (21%)
Qualification						
High school certificate	2 (14%)	-	1 (4%)	0 (0%)	1 (4%)	9 (47%)
Post-high school non-university (e.g. Trade certificate)	4 (29%)	-	4 (16%)	0 (0%)	8 (35%)	3 (16%)
University level	7 (50%)	-	19 (76%)	0 (0%)	14 (60%)	3 (16%)

Note. For the dissociative identity disorder (DID) group, five participants chose two ethnicities and one chose four ethnicities. For the child comparisons, two participants chose two ethnicities. For the psychosis clinical comparisons, one participant chose two ethnicities. For the adult comparisons, one participant reported no qualifications. For the clinical comparisons, four participants reported no qualifications.

Materials

Dissociative Experiences Scale (DES; Carlson & Putnam, 1993). The DES is a self-report measure assessing general dissociative experiences and symptoms over 28 items (Carlson & Putnam, 1993) (see Appendix D-2). Participants indicate the percentage of time they experience each dissociative item when not under the influence of alcohol and drugs using an eleven point scale ranging from 0 (never) to 100 (always). A mean is calculated, with scores ranging from 0 to 100. The DES is appropriate for assessing pathological and non-pathological dissociative experiences across the participant groups used in this experiment The DES has excellent psychometric properties in clinical and non-clinical populations (Bernstein Carlson et al., 1993; Brand, Classen, McNary & Zaveri, 2009). Table 2 shows the alphas for each sample in this study.

CDC (Putnam, Helmers, & Trickett, 1993). The CDC is a self-report measure assessing the presence of general dissociative experiences and symptoms in children (Putnam et al., 1993). Parents or guardians of the child in question indicate the extent to which children have exhibited 20 different dissociative behaviours over the last 12 months. The

scale is scored: 0 (not true), 1 (somewhat or sometimes true) and 2 (very true). An overall total is recorded, with scores of 12 and higher indicating that the child may be experiencing pathological dissociation. Child comparisons and child simulator participants received the CDC to compare their reported levels of pathological dissociation to the DID participants. The child simulators reported their own CDC scores rather than a parent or guardian, as is customary. The CDC has good psychometric properties (Putnam et al., 1993). Table 2 shows the alphas for both samples in this study.

Memory Characteristics Questionnaire (MCQ; Johnson, Foley, Suengas, & Raye, 1988). Participants were required to complete an item from the MCQ for each of their selected self-defining memories (outlined in procedure). Participants were asked about valence (negative or positive emotional connotation) of the selected memories measured on a 1 to 7 scale, where 1 indicated the memory holds a negative connotation and 7 indicated a positive connotation.

Scale to Assess Meaning Making (SMM; Wood & Conway, 2006). The SMM is a self-report measure assessing the extent to which participants report engaging in the process of meaning making for self-defining memories. The questionnaire determines whether people have experienced personal growth, insight and learned more about the meaning of their life in response to having experienced each event. A mean is calculated across six items with responses ranging between 1 (totally disagree) to 5 (totally agree). The SMM has good psychometric properties and has been used to assess both clinical and non-clinical populations. Cronbach's alpha has been reported to be between .75 to .86 (Berna et al., 2016; Wood & Conway, 2006). Table 2 shows the reliability using inter-item correlations, recommended when a scale is constructed of few items (e.g., Pallant, 2013). A mean of the correlations from each of the three memories was used to construct this value. The reliability

of the scale was satisfactory (i.e., see Briggs & Cheek, 1986, who recommend an optimal range for the inter-item correlations of .2 to .4).

Demographic Questionnaire. The demographic questionnaire included questions about participant age, gender, ethnicity and education level (see Appendix D-8).

Dissociative Disorders Interview Schedule (DDIS; Ross et al., 1989). The DDIS is a structured interview used to diagnose dissociative disorders. The DID section of the measure was used to make a clinical interview diagnosis of DID in the DID sample by the primary researcher (see Appendix D-1). Respondents were verbally asked questions about whether they feel they have distinct identities, whether these identities take control of their behaviour, whether they are sometimes unable to recall important personal information and whether these experiences are caused by substance abuse. The DDIS is a psychometrically sound measure for assessing the presence of dissociative disorders (Ross et al., 1989). Previous research has presented a kappa value of 0.68, indicating substantial agreement between clinicians for DDIS scores (Ross et al., 1989).

Mini-International Neuropsychiatric Interview (MINI; Sheehan et al., 1998). The MINI is a structured interview used to diagnose psychotic disorders. The psychosis section of the measure was used to confirm a clinical interview diagnosis of psychosis in the clinical comparisons and to exclude those psychosis symptoms in the non-clinical comparisons (none were positive; see Appendix D-10). The MINI is a psychometrically sound measure for assessing the presence of current and lifetime psychosis. For the child comparison group, it was adapted into language appropriate for their age range. For indications of current psychosis symptoms, previous research has acquired kappa coefficient values ranging between 0.88 and 1.00 for inter-rater reliability and 0.90 for test-retest reliability (Lecrubier et al., 1997).

Self-Defining Memory Task (Berna et al., 2011; Singer & Halbach Moffitt, 1992).

The Self-Defining Memory Task involved participants choosing three autobiographical memories from their past that (a) were at least one year old, (b) were remembered clearly, (c) felt currently important, (d) helped the person understand who they are as an individual (e) involved some strong feelings, (f) had been thought of many times and (g) were familiar like a picture that has been studied or a song learnt by heart. Participants gave each memory with a title, recorded their age when the events happened and estimated how long ago the event occurred.

Table 2

Cronbach's alphas for the DES and CDC, and inter-item correlations for the SMM by Group

Group	DES	CDC	SMM
DID adult identities (*n* = 14)	.84	-	.45
DID child identities (*n* = 14)	-	-	.28
Adult comparisons (*n* = 25)	.92	-	.32
Child comparisons (*n* = 26)	-	.91	.25
Child simulators (*n* = 23)	-	.88	.37
Psychosis clinical comparisons (*n* = 19)	.93	-	.49

Procedure

The study required written informed consent from all participants. This study was approved by both University and Hospital Research Committees. Participants were presented the questionnaire battery in an interview format, where the researcher read the questions aloud, and participants verbally responded.

Administration Procedure. The study was part of a larger experiment exploring sense of self and episodic autobiographical memory in DID. Measures unconnected to the present study included a card-sort task assessing sense of self and a narrative life story task. First, all participants signed a written informed consent form (Appendix B-7). Then the participants completed a questionnaire battery of the DES or CDC, MINI and demographic questionnaire (order randomised). DID participants were also administered the DDIS prior to the questionnaire battery. The measures unconnected to this study were presented after the questionnaire battery and were concluded before the self-defining memory task. The MCQ question and SMM were completed for each selected memory in the self-defining memory task.

Results

Valence.

Valence mean scores are reported in Table 3[7]. To assess for differences between DID identities, a repeated measures analysis of variance (ANOVA) was used, with Identity (DID adult identity, DID child identity) and Order of self-defining memory (first memory reported, second memory reported, third memory reported) as within-subjects factors. There was no significant main effect for Identity, $F(1, 10) = .00$, $p = .950$, $\eta_p^2 = .00$. This analysis also did not indicate a significant main effect for Order of self-defining memory, $F(2, 20) = 1.48$, $p =$

[7] Due to some participants not indicating valence for self-defining memories, the data was not available for analysis for all participant cases.

.251, η_p^2 = .13. The Order of self-defining memory x Identity interaction was not significant, reflecting no difference in valence between groups across memories, $F(2, 20) = .38$, $p = .690$, $\eta_p^2 = .04$.

To assess for differences between DID child identities, child comparisons and adult child simulators (i.e., adults simulating a child), a repeated measures ANOVA was used with Group (DID child identity, child comparison, adult simulator) as a between-subjects factor and Order of self-defining memory (first memory reported, second memory reported, third memory reported) as a within subject factor. There was a significant main effect for Group, $F(2, 48) = 3.80$, $p = .029$, $\eta_p^2 = .14$, with Gabriel's post-hoc tests indicating that the DID child identities presented a trend towards significantly more negatively valenced memories than child comparisons ($p = .090$). DID child identities did not differ in valence compared to child simulators ($p = .998$). Child comparisons presented memories with a more positive valence significantly more than child simulators ($p = .045$). The analysis did not indicate a significant main effect for Order of self-defining memory, $F(2, 96) = .31$, $p = .732$, $\eta_p^2 = .01$. The Order of self-defining memory x Group interaction was not significant, indicating that the differential pattern across groups did not vary across the three memories, $F(4, 96) = .26$, $p = .901$, $\eta_p^2 = .01$.

To assess for differences between DID adult identities, adult comparisons and psychosis clinical comparisons, a repeated measures ANOVA was used with Group (DID adult identity, adult comparisons, psychosis clinical comparison) as a between-subjects factor and Order of self-defining memory (first memory reported, second memory reported, third memory reported) as a within-subjects factor . There was no significant main effect for Group, $F(2, 49) = .92$, $p = .404$, $\eta_p^2 = .04$. The analysis did not indicate a significant main effect for Order of self-defining memory, $F(2, 98) = 1.00$, $p = .372$, $\eta_p^2 = .02$. The Order of self-defining memory x Group interaction was not significant, reflecting no differences in

valence between groups across the three different memories, $F(2, 98) = 1.20$, $p = .317$, $\eta_p^2 = .05$.

To assess for differences between adult comparisons and child comparisons, a repeated measures ANOVA was used with Group (adult comparisons, child comparisons) as a between-subjects factor and Order of self-defining memory (first memory reported, second memory reported, third memory reported) as a within-subjects factor. There was no significant main effect for Group, $F(1, 40) = 1.29$, $p = .262$, $\eta_p^2 = .03$. The analysis also did not indicate a significant main effect for Order of self-defining memory, $F(2, 80) = .91$, $p = .407$, $\eta_p^2 = .02$. The Order of self-defining memory x Group interaction was not significant, reflecting no differences in valence between groups across memories, $F(2, 80) = .62$, $p = .543$, $\eta_p^2 = .02$.

Table 3

Means (with SD) for Valence assigned to each Self-Defining Memory

Diagnostic group	Memory 1 (*SD*)	Memory 2 (*SD*)	Memory 3 (*SD*)	Memory Overall (*SD*)
DID Adult Identity (*n*=14)	4.43 (*2.71*)	4.57 (*2.47*)	3.21 (*2.12*)	4.07 (*1.80*)
DID Child Identity (*n*=11)	3.45 (*2.94*)	4.27 (*3.13*)	3.18 (*2.71*)	3.64 (*2.20*)
Adult Comparison (*n*=25)	3.88 (*2.30*)	4.96 (*2.59*)	4.40 (*2.63*)	4.41 (*1.85*)
Child Comparison (*n*=17)	4.94 (*2.38*)	5.06 (*2.44*)	5.24 (*2.61*)	5.08 (*1.87*)
Child Simulators (*n*=23)	3.65 (*2.39*)	3.78 (*2.54*)	3.74 (*2.51*)	3.72 (*1.22*)
Psychosis Clinical Comparisons (*n*=13)	3.69 (*2.21*)	3.46 (*2.15*)	3.62 (*2.43*)	3.59 (*1.59*)

Group Overall (n = 103)	4.22 (*2.45*)	4.43 (*2.49*)	4.00 (*2.55*)	4.14 (*1.77*)

Note. Valence was rated on a single item 1 – 7 scale, with 1 indicating negative emotional valence and 7 indicating a positive emotional valence

Meaning Making

Meaning making mean scores are reported in Table 4. To assess for differences between DID identities, a repeated measures analysis of variance (ANOVA) was used, with Identity (DID adult identity, DID child identity) and Order of self-defining memory[8] (first memory reported, second memory reported, third memory reported) as within-subjects factors. There was a significant main effect for Identity, $F(1, 10) = 6.69$, $p = .027$, $\eta_p^2 = .40$, with DID adult identities indicating more meaning making than DID child identities. The analysis did not indicate a significant main effect for Order of self-defining memory, $F(2, 20) = .09$, $p = .917$, $\eta_p^2 = .01$. There was an absence of a significant Order of self-defining memory x Identity interaction, reflecting no difference in meaning making between groups across the three memories, $F(2, 20) = .46$, $p = .514$, $\eta_p^2 = .04$.

To assess for differences between DID child identities, child comparisons and child simulators, a repeated measures ANOVA was used with Group (DID child identity, child comparison, child simulator) as a between-subjects factor and Order of self-defining memory (first memory reported, second memory reported, third memory reported) as a within subject factor . There was not a significant main effect for Group, $F(2, 54) = .184$, $p = .832$, $\eta_p^2 = .01$, suggesting that DID child identities reported engaging similar levels of reported meaning-making as children without DID and child simulators. The analysis also did not indicate a significant main effect for Order of self-defining memory, $F(2, 108) = .83$, $p = .437$, $\eta_p^2 = .02$. The Order of self-defining memory x Group interaction was not significant, reflecting no

[8] Although we were not interested in the effect of order of memory retrieved, this variable was included to account for the variance introduced by order of memory.

differences in meaning making between groups across memories, $F(2, 54) = .18$, $p = .837$, $\eta_p^2 = .01$, reflecting no differences in meaning making between groups across the three memories.

To assess for differences between DID adult identities, adult comparisons and psychosis clinical comparisons, a repeated measures ANOVA was used with Group (DID adult identity, adult comparisons, psychosis clinical comparisons) as a between-subjects factor and Order of self-defining memory (first memory reported, second memory reported, third memory reported) as a within-subjects factor. There was not a significant main effect for Group, $F(2, 51) = .59$, $p = .56$, $\eta_p^2 = .02$, indicating that DID adult identities reported engaging the same degree of meaning making around self defining memories as adults without DID and those with a psychotic disorder. The analysis also did not indicate a significant main effect for Order of self-defining memory, $F(2, 102) = .52$, $p = .598$, $\eta_p^2 = .01$. The Order of self-defining memory x Group interaction was not significant, reflecting no differences in meaning making between groups across memories, $F(4, 102) = .28$, $p = .892$, $\eta_p^2 = .01$.

To assess for differences between adult comparisons and child comparisons, a repeated measures ANOVA was used with Group (adult comparisons, child comparisons) as a between-subjects factor and Order of self-defining memory (first memory reported, second memory reported, third memory reported) as a within-subjects factor. There was a significant main effect for Group, $F(1, 46) = 18.86$, $p < .001$, $\eta_p^2 = .29$, with adult comparisons reporting more meaning making than child comparisons. The analysis did not indicate a significant main effect for Order of self-defining memory, $F(2, 92) = 1.51$, $p = .226$, $\eta_p^2 = .032$. The Order of self-defining memory x Group interaction was not significant, indicating that the differential pattern across groups did not vary across the three memories, $F(2, 92) = .641$, $p = .529$, $\eta_p^2 = .01$.

Table 4

Means (with SD) for Meaning Making assigned to each Self-Defining Memory

Diagnostic group	Memory 1 (*SD*)	Memory 2 (*SD*)	Memory 3 (*SD*)	Memory Overall (*SD*)
DID Adult Identity (*n*=14)	4.93 (*1.38*)	4.71 (*2.02*)	4.79 (*1.71*)	4.81 (1.44)
DID Child Identity (*n*=11)	3.82 (*1.66*)	3.73 (*2.24*)	3.91 (*1.64*)	3.82 (*1.51*)
Adult Comparison (*n*=25)	5.40 (*1.15*)	5.20 (*1.50*)	5.20 (*1.12*)	5.27 (*.92*)
Child Comparison (*n*=23)	4.26 (*1.45*)	3.52 (*1.70*)	4.04 (*2.01*)	3.94 (*1.19*)
Child Simulators (*n*=23)	4.35 (*1.53*)	4.00 (*2.02*)	3.96 (*2.12*)	4.10 (1.40)
Psychosis Clinical Comparisons (*n*=15)	5.13 (*1.60*)	5.27 (*1.39*)	4.87 (*1.92*)	5.09 (*1.56*)
Group Overall (*n* = 111)	4.63 (*1.53*)	4.39 (*1.88*)	4.48 (1.82)	4.53 (*1.40*)

Note. Meaning-making was rated on a six item 0 – 6 scale, with 0 indicating no presence of meaning-making and 6 indicating high levels of meaning-making.

Discussion

The present study assessed the use of meaning-making in relation to self-defining memories by DID identities. DID adult identities reported more meaning-making compared to DID child identities. DID child identities did not present any differences compared to child comparisons. Similarly, DID adult identities were also indistinguishable from the adult comparisons, as were the psychosis clinical comparisons. DID identities thus appear to be able to be distinguished based on reported age for meaning-making and are comparable to control groups that match this age. The reported use of meaning making in DID adult

identities as well as psychosis patients did not differ significantly from that of the healthy adult comparison group.

According to subjective reports of those with DID, distinct identities have their own sense of agency and way of perceiving the world (American Psychiatric Association, 2013). Consistent with the first hypothesis, identities showed a more advanced reported engagement of meaning-making when they identified as being an adult compared to a child. This finding provides support for theories stating that child identities do not advance the more mature cognitive processes typical in normal development (Putnam, 1997) as DID child identities report abilities that are more limited than those seen in a person of their biological age. Supporting this is the finding that adult comparisons presented with significantly more meaning-making than child comparisons, a finding in line with previous studies (Mclean & Thorne, 2003; Thorne et al., 2004). However, it should also be acknowledged that in DID, the reports of differential meaning-making may be moderated and determined by the perceived age of each identity by patients rather than reflect a differential ability in meaning making. The comparability of DID adult identities to adult comparisons did not support the hypothesis and was surprising in that a central definition of DID is a discontinuity in sense of self. These results indicate a similar reported ability to use cognitive processes involved with integration of autobiographical memories into sense of self by both groups. Meaning-making is implicated in the integration of autobiographical memories into the self-concept, which supports development of a continuous sense of self (Blagov & Singer, 2004). That these two groups were indistinguishable indicates the reported ability to gain insight and personal growth from experiences is preserved in DID adult identities, with the results of this for sense of self an avenue for further exploration.

Consistent with the second hypothesis, the comparability of DID child identities to child comparisons supports the idea that people with DID do present with an impairment in

the processes that support integration of autobiographical memory into a well-developed sense of self. However, the comparability of DID child identities to child simulators makes it difficult to interpret the results in this way. As simulation of a reduction in meaning-making was able to occur, it cannot be distinguished whether DID child identity performance is indicative of a true (akin to child comparisons) or feigned impairment.

Although inconsistent with the hypothesis, the results presented in this study support previous research (Huntjens et al., 2016) which has failed to find a distinction between the emotional valence of autobiographical memory across DID identities.

In line with Berna et al. (2016), participants with psychosis showed no impairment in their reported engagement of meaning-making for self-defining memories. Their performance was equivalent to adult comparisons, indicating that the reported ability to gain insight and growth from the consideration of self-defining memories is comparable between various clinical groups and the general population, despite psychological differences. These results directly contrast previous research associated with psychosis and meaning making, which have used researcher transcribed narratives to grade the presence of meaning making (Berna et al., 2011). The present study only measured participant's subjective reports of their experiences, meaning future studies should assess participant's reported meaning-making ability using measures that are more objective. Previous research has consistently indicated a discrepancy in subjective and objective measurements of the abilities of DID identities, for example, although amnesia is often reported between identities (Marsh et al., in prep a; Marsh et al., in prep b), use of more objective measures indicate the presence of inter-identity memory retrieval (Marsh et al., 2018). In addition to use of objective measures of meaning-making, use of longitudinal studies would provide evidence of whether meaning-making acts as a precursor or maintenance factor for subjectively reported identity disintegration.

A limitation of the study was the small sample sizes for DID participants and psychosis clinical comparisons. Although the DID sample presented here exceeded the sample size of comparable studies (e.g., Huntjens et al., 2016), future studies should aim to include larger samples to replicate the current findings in a more powerful design.

The present study assessed the reported ability for DID identities to engage meaning-making for self-defining memories. DID participants indicated a subjective belief of identity fragmentation, supported by discrepancies in the meaning-making reported between adult and child identities. However, the use of a self-report instrument and the resembling scores of simulators rendered an unambiguous interpretation of the results difficult, calling for future research including more objective measures of meaning making and related cognitive processes in DID.

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Chapter 6

General Discussion

At the heart of dissociative identity disorder (DID) are issues related to a fragmented sense of identity and the compartmentalisation of memory, including episodic autobiographical experiences. For example, the first DSM-5 criterion for DID describes a disruption of identity characterised by the presence of two or more distinct personality states. The disruption in identity involves marked discontinuity in sense of self and sense of agency (American Psychiatric Association [APA], 2013). The second DSM-5 criterion describes recurrent gaps in the recall of everyday events, traumatic events and important personal information (APA, 2013). It is common for patients with DID to report inter-identity amnesia, that is, a lack of access to memories of events that have been experienced by other identities (Allen & Movius, 2000; Dorahy, 2001; Dorahy & Huntjens, 2007; Loewenstein, Frewen, & Lewis-Fernández, 2017). The implications of this subjectively reported memory compartmentalisation in DID on the phenomenological experience of sense of self in different identity states is not well understood. As memories of episodic, autobiographical events are centrally associated with the development of sense of self, the intention of this thesis was to investigate the relationship between this type of memory and its compartmentalisation in DID, as well as the cognitive processes that support integration of autobiographical memories into a person's self-concept. Chapters two, three and four focused on inter-identity amnesia for episodic autobiographical experiences, while chapter five studied the process of meaning making for autobiographical memories. Based on the posttraumatic model of DID (Dalenberg et al., 2012), amnesia for episodic autobiographical memory was expected. Due to the subjectively reported inability for memory to transfer between identities of Emotional Parts of the personality (EP) that recall trauma and identities of Apparently Normal Parts (ANP) that deny having access to these memories (van der Hart, Nijenhuis & Steele, 2006), amnesia for events experienced in another type of identity was anticipated. Adult DID identities were expected to report more use of meaning-making than

child DID identities. Due to indications that child identities do not present with the usual developmental trajectory seen in a person growing from childhood to adulthood (Putnam, 1997), their reported use of cognitive processes developed later in adolescence was expected to be impaired.

Inter-Identity Transfer in DID

Although previous research has explored inter-identity amnesia, there has been a lack of studies assessing the transfer of self-referential material, with these types of memories greatly associated with the development of sense of self. Chapter two used an explicit retrieval task to assess transfer of episodic self-referential memory. Chapter three used the same task but measured transfer of episodic autobiographical memory. DID participants exhibited amnesia for information encoded in another identity. They scored significantly lower on recognition sensitivity and showed a more conservative response bias for stimuli encoded in another identity compared to stimuli encoded in the same identity. The performance of DID participants was comparable to members of the general population who were exposed to only one set of stimuli (amnesic comparisons). Moreover, DID participants reported a qualitatively different way of retrieving experiences of the other identity, with these events less likely to be retrieved with autonoetic consciousness, whereas no identity differences were found for retrieval with noetic consciousness. Simulation of amnesia proved possible on the tasks used in this study, with simulators presenting the profile of amnesia seen in DID participants. Simulators also presented with the same reduction in autonoetic consciousness for other identity material. Due to the parallels between results for DID and simulator groups, it is not possible to determine whether DID participants presented a true inability to access information experienced in another identity, or were simulating inter-identity amnesia. More indirect forms of testing retrieval for autobiographical experiences in DID were thus required to assess whether amnesia is related to deficits in retrieval processes

or not. Chapter four used such an objective, indirect test to determine the extent of inter-identity amnesia for episodic memory with a self-referential component. DID participant performance on the autobiographical Implicit Association Test (aIAT) indicated inter-identity transfer of episodic self-referential memory. The performance of DID participants was comparable to nonamnesic comparisons (i.e., members of the general population who were exposed to the stimuli presented in both identities). Although they were also comparable to the simulator group, simulators indicated a trend towards inter-identity amnesia not presented by the DID participants.

In summary, the findings from these three studies indicate subjective reports of inter-identity amnesia for episodic self-referential and autobiographical memory, but transfer of episodic self-referential memory across amnesic identities when using a more indirect objective measure of memory retrieval. These results are in line with previous research assessing semantic, episodic and semantic autobiographical memory (Huntjens, Postma, Hanmaker, Woertman, & van der Hart, 2002; Huntjens, Postma, Peters, Woertman, & Van der Hart, 2003; Huntjens, Verschuere, & McNally, 2012).

Meta-Memory Impairment in DID

The findings that amnesia was easily simulated on the tasks presented in chapters two and three offers some credibility to the view that the DID participants performance may have been produced by demand characteristics or simulation of inter-identity amnesia. An alternative possible explanation has been proposed by Huntjens et al. (2006) and Huntjens, Peters, Woertman, Van der Hart, & Postma (2007). These researchers argued that a meta-memory problem may explain the subjective reports of inter-identity amnesia. Amnesic identities are said to believe at a metacognitive level that they are unable to retrieve information of events experienced by another identity, and as a result DID participants may not actively search for memories they believe they cannot access (i.e., were encoded in

another identity state) or attribute retrieved memories to the other identity state (Huntjens et al., 2007). The theory of a meta-memory impairment suggests that people with DID may not realise the full extent of their memory abilities and the belief in compartmentalisation of identities held by those with DID may generate the results of inter-identity amnesia instead of conscious simulation.

Agreeing with this view are subtle differences between the patterns of responding of DID participants versus simulators. In chapters two and three, DID participants scored higher on sensitivity and showed a more liberal response bias for stimuli presented to their amnesic identities compared to simulators. These differences between these two groups indicate it is unlikely that feigning of amnesia is a sufficient explanation for the DID patient behaviour. In chapter four, although the two groups showed a profile of inter-identity transfer, simulators showed a trend towards inter-identity amnesia not presented by the DID participants. In the context of the meta-memory explanation of the current findings, it is also worth mentioning that there were also subtle differences between the patterns of responding of DID participants and amnesic comparisons. In chapters two and three, DID participants again scored higher on sensitivity and showed a more liberal response bias for stimuli presented to their amnesic identities compared to amnesic comparisons. When taken together, the research from the first three studies provides no evidence of a full amnesic barrier in DID, as leakage of information, especially in recognition tasks and the aIAT was evident.

Implications for DID Etiology

Due to the nature of DID, researchers have historically speculated that the negative emotional valence of stimuli may render it less able to transfer across identities, due to an avoidance of some identities to deal with these experiences. The posttraumatic model conceptualises the development of DID occurring due to a need for children to avoid experiences of trauma, resulting in the separation of the self into different identities (Dorahy

et al., 2014; Kluft, 1999). Theoretical formulations suggest that inter-identity amnesia may be more prevalent between emotional parts (EP) of the personality, who are fixated on the re-experiencing of abusive and traumatic events, and Apparently Normal Parts (ANP) of the personality, who are avoidant of the memories of these experiences and report amnesia (Van der Hart, Nijenhuis, Steele, & Brown, 2004). In the first three studies presented in this thesis, identities were used that differed in their reported retrieval of traumatic past events. A combination of emotional and neutral stimuli were used, with the findings supporting the results of previous studies which indicate that emotional valence does not impact transfer (Huntjens et al., 2005; Huntjens et al., 2007). Participants do not appear to compartmentalise information of a more neutral nor of a more emotional nature, which may be expected based on a strict following of the etiology of DID as proposed by the posttraumatic model. Yet, the current studies did not assess episodic autobiographical traumatic experiences, which would be the types of experience most prone to compartmentalisation according to the posttraumatic model. Nonetheless, while the present results do not discount that traumatic experiences in childhood lead to DID development, identities may not be as 'distinct' as once thought. A further conclusion regarding the validity of the proposed posttraumatic and sociocognitive model in the context of DID is not possible. In essence, these models are models explaining etiology, and the sociocognitive model can only be falsified by demonstrating that dissociative fragmentation is primarily a direct reaction to childhood adversity (noting that an array of other contributing factors will be present, including sociocognitive factors that are influential in all psychiatric presentations) and does not emerge primarily as a consequence of iatrogenesis or other knowledge concerning the expected features of DID available to patients.

Meaning-Making in DID

As participants appear to have some ability to access shared autobiographical memories, chapter five assessed whether the cognitive processes associated with the integration of autobiographical memories in one's life story (i.e., meaning making) were impaired in DID. As people with DID describe experiencing a fragmented sense of self, the reported use of the cognitive processes that support identity integration was explored. DID adult and child identities were compared on their reported use of meaning-making for self-defining memories. Although DID adult and child identities reported memories that were similar in emotional valence, child identities reported poorer meaning-making than adult identities, comparable to child comparisons and child simulators. These results were, however, again difficult to interpret given the comparable results of simulators who completed the questionnaire pretending to be a child. Future research should use more objective measures of meaning making and related cognitive processes to assess the extent to which people with DID have developed the tools to be able to integrate their past into their sense of self.

Limitations

It is important to recognise that due to small sample sizes, conclusions based on the current results should be drawn with caution. Current discussion in the scientific field indicates that although results characterised by low statistical power are less likely to detect a true effect, studies with small samples presenting statistically significant results may also be less reliable. In these cases, there may be an overestimation of effect sizes and a lack of ability for future studies to reproduce the results (Button et al., 2013). At present, much research uses small sample sizes without consideration of these concerns and they should be considered in future research in DID. Although it is difficult to recruit large sample sizes of DID participants, for studies like those conducted in this thesis because patients need to be

stable, have the capacity to move between different identities on command and report amnesia between these identities, the sample sizes of the present studies were comparable and in some cases exceeded previous studies. With regard to population generalisability, it may be worthwhile testing patients who are at the beginning of therapy as they may show more amnesia, but on the other hand the patients we included in the present studies did report amnesia subjectively. In addition, patients at the beginning of therapy would be less likely to have the ability to switch between identities on request.

Clinical Applications

Amnesia is a core DSM-5 diagnostic criterion for DID; however, the strong clinical impression of amnesia depends exclusively on self-report (as do most symptoms in psychiatric disorders). Research at present indicates that outside of self-report, transfer of memory between amnesic identities is possible. Clinicians may have much to gain by focusing therapy around the idea of a meta-cognitive impairment as an explanation of reported inter-identity amnesia instead of a structural compartmentalisation of information. In future theoretical as well as empirical work, it would be interesting to explore the possibility of devising therapy based on the idea that amnesia in DID is more of a meta-cognitive impairment. Such an approach would understand the person's attempt to separate their identities as a coping strategy. By working in a way that separates their identities, participants perpetuate and maintain their disorder (Fisher & Wells, 2009). Although people may have a belief in their amnesia, and the distinctness of their identities, the findings presented in chapter four show that these separations may not be as distinct as they are perceived by those with DID.

Implications for DSM-5 Diagnostic Criteria

The results presented in this thesis also raise questions as to the amnesia criteria in the DSM-5. As research in this field has consistently shown the ability for memory transfer to be

possible, it may be helpful for the criteria to be updated in a way that takes these findings into consideration. Use of more empirically based diagnostic criteria may provide a more accurate way for clinicians to distinguish those patients presenting with DID from those presenting with a different diagnosis. Two avenues for future research should be explored. One is further objective assessment of episodic, autobiographical memory transfer in amnesic identities via use of trauma-related stimuli. As identities that report amnesia often report differences in their ability to access traumatic events, potential differences in the content of these memories across amnesic identities should be explored. Research indicates that memories are more easily encoded when they can be linked to already existing autobiographical knowledge bases. Previous research has indicated that identities in people with DID often report self-defining memories with similar amounts of traumatic content (Huntjens et al., 2016). However, other similarities and differences in the content of these memories has not been systematically explored. Future research should focus on whether stimuli of a traumatic, self-referential nature also show transfer across amnesic identities. A second avenue is to navigate other cognitive processes, which may be impaired in DID. One of the roles of autobiographical memory is to integrate past experiences into our sense of self. When well-integrated, people are better able to attain their goals, solve difficult problem-situations, and feel a sense of growth over time (Berna et al., 2011; Berzonsky et al., 2013; Sheldon, Kasser, Smith, & Share, 2002). This thesis explored the process of meaning-making of past life experiences, however the process of reflecting over autobiographical memories is multifaceted. Research into identity processing style, related to how people process identity-relevant information, is likely to provide further insight about the ability for identities to integrate information that does not support their self-concept (Berzonsky, 1989; Berzonsky et al., 2013). Furthermore, exploration of the situational use of memory reflection, that is whether identities in DID choose to engage autobiographical remembering in similar

situations as the general population, may provide insight into whether there are differences in the reason that a person with DID chooses to reflect on their autobiographical memories (Bluck & Alea, 2011). The extent of integration of identity should also be assessed by determining the extent of identity fragmentation and identity continuity over time. Research using a task akin to the card-sort task (Showers, 1992) is likely to identify whether organisation of self-concepts (e.g., viewing the self as positive or negative across areas in one's life) is comparable across identities. An understanding of the differences and similarities in the use of these processes to develop a well-integrated identity may provide insight into why compartmentalisation of autobiographical memories may be perceived to occur in those with DID (as seen in chapters two and three).

It would also be worthwhile to assess more clinical comparison groups in future research. People with DID report receiving initial diagnoses of borderline personality disorder, posttraumatic stress disorder and schizophrenia to conceptualise their clinical presentation (Ellason, Ross, & Fuchs, 1996). Assessment of differences and transdiagnostic similarities between DID identities and the disorders for which they often receive a differential diagnoses for may present great benefit. At the moment, one of the main criteria in DID is a memory impairment, which differentiates it from other disorders that could be open for differential diagnosis. Research at present, however, indicates that many features of, for example, psychosis are present in DID, for example, internal locus of voice hearing (Ellason & Ross, 1997; Kluft, 1984; Longden, Madill, & Waterman, 2012). Additionally, these groups often experience maltreatment that impacts their likelihood to develop the disorder. The differences with DID exist with regards to reported separated identities and amnesia, with this thesis presenting research that both of those may be a subjective impairment of DID indicative of a more meta-cognitive impairment. This also raises the question of whether interventions associated with psychosis and other related disorders may

provide some benefit to those with DID, or may do so if undergoing adaptations given that the most distinct differential diagnosis criteria are unsupported by empirical studies.

Conclusion

This thesis provides additional evidence of an intact ability to access memories perceived to be inaccessible. Despite beliefs in an inability to retrieve certain memories due to an imperceptible memory barrier, DID identities present ability to access these memories if an objective task is used. Although there is evidence of a discrepancy in the reported use of meaning making across DID identities, more objective tests are required to explore whether this finding is also limited to the subjective realm. The perception reported by those with DID of compartmentalisation of their identities is not supported by the evidence of memory transfer presented in this thesis.

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English Summary

The literature review explored the current state of research of amnesia in DID. The DSM-5 criteria of DID include the presence of two or more distinct identities and an inability to remember everyday events and important personal information. Some identities in DID also report a lack of access to memories of traumatic events that have occurred, while other identities will report full access to the details of these memories. At present, DID research has assessed the extent of inter-identity amnesia for procedural, semantic, episodic and semantic autobiographical memory. Findings have indicated that despite the subjective reports of amnesia supported by results gained using measures of explicit memory retrieval, more objective tests tend to indicate a pattern of inter-identity transfer. As of yet, little research has explored episodic autobiographical memory in DID. Episodic autobiographical memory is associated with events that include self-referential characteristics and can be used to construct a person's sense of self. As DID is a disorder characterised by separated identities that claim to have access to isolated memories, this memory system warrants further investigation.

Chapter two explored the extent of inter-identity amnesia of episodic, self-referential memories in dissociative identity disorder (DID). People with DID often report amnesia for events that have occurred in another identity. However, previous research has indicated that this may be more of a perceived than actual impairment, with research assessing other forms of memory (semantic, episodic, semantic autobiographical) indicating an ability for transfer to occur. The field has yet to explore the extent of this amnesia with regard to episodic, self-relevant information. Participants were required to imagine themselves in and remember details of situations described in vignettes. Two amnesic identities were selected to receive one vignette each. Measures of free recall and recognition were used to assess explicit memory retrieval of the vignettes administered to both identities. Nineteen DID participants, 16 DID simulators, and 41 comparison participants were recruited. The results support the subjective reports of amnesia, with the recognition test indicating a profile of inter-identity amnesia and recall test indicating a trend for inter-identity amnesia. DID participants were comparable to DID simulators, and comparison participants who did not receive any stimuli administered to the second identity. As a result of the similarity in DID and DID simulator performance as well as the discrepancy of the current findings with previous literature, further testing utilising actual episodic, autobiographic memories should be carried out.

Chapter three assessed inter-identity amnesia of episodic, autobiographical memories in dissociative identity disorder (DID). People with DID often report amnesia for events that

have occurred in another identity, however, previous research indicates mixed support for whether this is the case. Although previous research has found evidence of inter-identity transfer of semantic, episodic and semantic autobiographical memory, procedural and episodic self-referential memory has presented inter-identity amnesia. As research is yet to investigate episodic autobiographical memory transfer, this was explored in the present study. Participants were required to engage with and remember the details of behavioural tasks. Two amnesic identities were selected to each receive a set of the behavioural tasks. Measures of free recall and recognition were used to assess explicit memory retrieval of the behavioural tasks administered to both identities. Nineteen DID participants, 16 DID simulators and 41 comparison participants were recruited. The results support the subjective reports of amnesia and empirically tested findings of inter-identity amnesia for procedural and episodic self-referential memory. DID participants were comparable to DID simulators, and comparison participants who did not receive any stimuli administered to the second identity. Due to the similarity of performance profile between DID participants and DID simulators, future research should utilise more objective measures of inter-identity memory to further explore these findings.

Chapter four assessed inter-identity amnesia of episodic, autobiographical memories in dissociative identity disorder (DID). Although people with DID often report amnesia for events that have occurred in another identity, previous empirical research has indicated mixed support for these findings. The present study assessed inter-identity transfer of episodic, self-referential memory on tests of implicit retrieval. Participants were required to imagine themselves in and remember details of situations described in vignettes. Two amnesic identities were selected to receive one vignette each. An autobiographical Implicit Association Test (aIAT) was used to assess memory transfer. Nineteen DID participants, 16 DID simulators, and 41 comparison participants were recruited. Results indicated a profile of inter-identity transfer. The results did not support the subjective reports of amnesia and instead support the thesis of inter-identity amnesia being more of a perceived than actual deficit. The performance of DID participants was significantly different from DID simulators, indicating that DID participants are not simulating inter-identity amnesia.

Chapter five assessed reported meaning-making for self-defining memories in dissociative identity disorder (DID). As people with DID often report a fragmented sense of self, meaning-making, a cognitive process that supports the integration of autobiographical memories into a person's self-concept, was explored. Participants were required to select three self-defining memories and indicate the extent of meaning-making for each memory.

Fourteen DID participants, 25 adult comparisons, 26 child comparisons, 23 child simulators and 19 psychosis clinical comparisons were recruited. Results indicated that DID adult identities reported significantly more meaning-making than DID child identities, with both identity groups presenting comparable results to their age matched control groups. Due to the similarity in performance profile between DID child identities and child simulators, future research should use more objective measures to explore the extent to which DID adult and child identities differ on reported meaning-making. As this study measured participant's subjective reports of meaning-making, use of more objective measures may also determine whether groups can be differentiated on the actual process.

The general discussion revisits the areas covered in this thesis. Studies one, two and three provide evidence of episodic self-referential and autobiographical memories staying compartmentalised in amnesic identities in dissociative identity disorder (DID) on tests of free recall and recognition but presenting transfer on more objective measures of retrieval (autobiographical Implicit Association Task). Chapter five explored whether identities differ in their reported ability to gain insight and draw meaningful lessons from experienced events, with the differences presented by DID adult and child identities requiring further exploration. As one of the principal uses of episodic autobiographical memory is to construct and update a person's sense of self over time, subjective impairment in some identities meaning-making ability has the potential to maintain a fragmented sense of self. Overall, these findings support the idea of a meta-memory impairment in DID as opposed to a true memory impairment. Changing the focus of memory therapy to explore this meta-cognitive impairment may better help clients gain insight into their memory impairment. Current clinical practice exclusively uses self-report to determine the presence of the DSM-5 diagnostic criterion of amnesia, however, the present thesis indicates use of more objective measurements of amnesia may be beneficial. In addition, it may be worth revisiting the DID DSM-5 criteria to reflect the meta-memory presentation supported by empirical research, rather than a true memory impairment.

Nederlandse samenvatting

Patiënten met een dissociatieve identiteitsstoornis (DIS) hebben het gevoel dat hun identiteit is opgesplitst in twee of meer delen of persoonlijkheidstoestanden die geregeld de controle over hun gedrag overnemen. De diverse persoonlijkheidstoestanden gaan daarnaast gepaard met verschillen in onder andere perceptie, zelfgevoel, affect en cognitie. Ook worden deze patiënten gekenmerkt door het onvermogen om alledaagse gebeurtenissen en belangrijke persoonlijke informatie uit het verleden te onthouden. Specifiek wordt er geheugenverlies (amnesie) voor gebeurtenissen gerapporteerd die ze in een andere persoonlijkheidstoestand hebben meegemaakt. Belangrijk is ook dat patiënten in sommige identiteiten het onvermogen rapporteren om zich traumatische gebeurtenissen uit het verleden te herinneren, terwijl andere identiteiten vertellen volledige toegang tot de details van deze herinneringen te hebben. Deze veronderstelde compartmentalisatie van herinneringen is ook in overeenstemming met het belangrijkste theoretische model van DIS, het posttraumatisch model.

In eerder onderzoek, waarbij gekeken is naar amnesie met betrekking tot verschillende vormen van geheugen in DIS, werd echter vaak bewijs gevonden voor overdracht van herinneringen tussen identiteiten in plaats van de door patiënten genoemde amnesie, met name wanneer er in het onderzoek gebruik werd gemaakt van objectieve taken om de amnesie vast te stellen, in tegenstelling tot instrumenten die gebruik maken van zelfrapportage. Deze resultaten zijn zowel gevonden voor procedurele, semantische, episodische en semantisch autobiografische herinneringen. Echter, tot nu toe is er geen onderzoek geweest naar amnesie specifiek voor episodische zelf-referentiële en autobiografische herinneringen bij patiënten met DIS. Juist voor deze herinneringen ligt inter-identiteit amnesie voor de hand, gezien de centrale rol van deze herinneringen bij het construeren en reconstrueren van de identiteit.

Na een algemene inleiding op het fenomeen inter-identiteit amnesia vanuit de klinische context en een uitgebreide beschrijving van eerder empirisch onderzoek in hoofdstuk één van dit proefschrift, is in hoofdstuk twee gekeken naar de mate van inter-identiteit amnesie voor episodische, zelf-referentiële herinneringen in patiënten met DIS. Aan het onderzoek namen in totaal 76 mensen deel (19 patiënten met DIS, 16 acteurs die DIS simuleerden, 20 gezonde controles en 21 gezonde controles die het stimulusmateriaal niet te zien kregen en dus als amnestische controlegroep fungeerden). De deelnemers moesten zich voorstellen dat ze figureerden in situaties die verteld werden in de vorm van vignetten. Ze namen deel in twee identiteiten die elk een ander vignet te horen kregen. Als maat voor

expliciete retrieval van herinneringen werden free recall en recognitie van beide vignetten gemeten in één identiteit. Subjectief rapporteerden alle DIS patiënten amnesie voor het vignet dat gezien was in de andere identiteit. De resultaten lieten een trend zien voor amnesie op de free recall taak en een significant effect voor amnesie op de recognitietaak. Op deze expliciete geheugentaken scoorden patiënten slechter in vergelijking met gezonde controles en hun scores waren vergelijkbaar met de scores van de amnestische controlegroep. Echter, hun scores waren ook vergelijkbaar met de scores van de simulanten waardoor een eenduidige conclusie moeilijk te trekken is.

In hoofdstuk drie is gekeken naar amnesie voor episodische autobiografische herinneringen in dezelfde groepen deelnemers. De deelnemers voerden diverse neutrale gedragstaken uit (zoals het opzoeken van een boek). Elk van de twee deelnemende identiteiten deed andere taken. Wederom werd daarna het geheugen van een van deze identiteiten getoetst voor de taken die in beide identiteiten waren gedaan met behulp van een free recall taak en een recognitietaak. Wederom scoorden de patiënten vergelijkbaar met de amnestische controlegroep en kwamen hun taakscores dus overeen met hun subjectieve rapportage van amnesie. Echter, ook op deze taak scoorden de mensen die DIS simuleerden vergelijkbaar, waardoor een definitieve conclusie wederom lastig te trekken is. Deze resultaten vragen dus ook om het toepassen van meer objectieve taken om amnesie te meten, dat wil zeggen taken waarop simulatie moeilijk of onmogelijk is.

Deze aanpak is gekozen in hoofdstuk vier waarin amnesie is bepaald voor autobiografische herinneringen, wederom in dezelfde deelnemende groepen. De procedure was vergelijkbaar met de studie die in hoofdstuk twee werd beschreven, maar nu werd het geheugen getest met een autobiografische Impliciete Associatie Test (IAT). De resultaten duidden, in tegenstelling tot de gerapporteerde amnesie en de bevindingen uit de vorige hoofdstukken, op een overdracht van herinneringen tussen identiteiten. Daarnaast verschilde de taakprestatie van DIS patiënten van die van DIS simulanten, er werd dus geen bewijs gevonden voor simulatie van amnesie bij mensen met DIS.

In het laatste empirische hoofdstuk van dit proefschrift stond betekenisgeving van autobiografische herinneringen centraal, een cognitief proces dat de integratie van autobiografische herinneringen in het zelfconcept van een persoon ondersteunt. De hypothese was dat patiënten minder gebruik maken van dit proces omdat ze vaak een gefragmenteerd zelfgevoel rapporteren. We vroegen deelnemers drie zelfbepalende herinneringen op te schrijven en hierna voor elke herinnering de mate van betekenisgeving (door het invullen van statements als “nu ik deze ervaring heb gehad, heb ik meer inzicht in wie ik ben en wat

belangrijk is voor mij"). In totaal deden mensen mee, 14 mensen met DIS, 25 gezonde mensen, 26 kinderen, 23 acteurs die deden alsof ze een kind waren, en een klinische vergelijkingsgroep van 19 patiënten met psychotische ervaringen. Bij elke DIS patiënt werd een volwassen identiteit met een kind-identiteit vergeleken, om na te gaan of ze in hun kind-identiteit minder gebruik maakten van betekenisgeving (wat de identiteitsfragmentatie in stand zou kunnen houden). Uit de resultaten bleek dat DIS patiënten inderdaad rapporteerden minder gebruik te maken van betekenisgeving in hun kind-identiteit in vergelijking met hun volwassen identiteit, waarbij ze in hun kind-identiteit vergelijkbaar scoorden met gezonde kinderen en in hun volwassen identiteit als gezonde volwassenen. Patiënten met DIS rapporteren dus inderdaad, in ieder geval in sommige persoonlijkheidstoestanden, minder gebruik te maken van hun vermogen om lering te trekken uit ervaringen uit het verleden en dit houdt mogelijk hun gevoel van identiteitsfragmentatie in stand. Echter, ook de acteurs die deden alsof ze een kind waren, scoorden vergelijkbaar met de gezonde kinderen en met patiënten met DIS in hun kind-identiteit, waardoor een definitieve conclusie moeilijk te trekken is. Om daadwerkelijk vermogen tot betekenisgeving te meten in plaats van zelfrapportage zou er beter een objectieve taak gebruikt kunnen worden in toekomstig onderzoek.

Hoofdstuk zes bevat een algemene discussie van de bevindingen van dit proefschrift. De grootste limitatie van het onderzoek beschreven in het huidige proefschrift omvat de relatief kleine steekproeven van proefpersonen. Toekomstig onderzoek zou dus gebruik moeten maken van grotere steekproeven. Daarnaast maakt het huidige proefschrift duidelijk dat het gebruik van meer objectieve metingen van functioneren bij mensen met DIS noodzakelijk is. Met een dergelijke taak kan men in toekomstig onderzoek verder in kaart brengen of gebrekkige betekenisgeving aan autobiografische herinneringen een daadwerkelijke tekortkoming is bij DIS en/of andere processen die gerelateerd zijn aan identiteit(re)constructie. Dit punt is ook van belang voor de klinische praktijk. Tenslotte zou het ontwikkelen van een therapievorm die de metacognitieve opvattingen van de client als uitgangspunt neemt, in plaats van uit te gaan van geheugen compartmentalisatie, patiënten kunnen helpen om inzicht te krijgen in hun stoornis.

De voornaamste bevinding van overdracht van informatie tussen identiteiten bij mensen met DIS in dit proefschrift is niet in overeenstemming met het posttraumatisch model. De bevindingen zijn wel in overeenstemming met een verklaring in termen van een meta-geheugenstoornis in DIS in tegenstelling tot een stoornis in het daadwerkelijk opslaan of ophalen van herinneringen. In het licht van de huidige bevindingen zou het verstandig zijn

de DSM-5-criteria voor DIS opnieuw te bezien en deze weer te geven als een stoornis in het meta-geheugen.

Appendix A

Information overview for potential participants

Appendix A-1: Recruitment letter for DID participants for Chapters two, three and four

Information letter to clients regarding the study
"The Relationship between Memory Functioning and Dissociation"

We are writing to ask for your participation in research aimed at furthering the understanding of dissociative identity disorder (DID). While your insight into these issues may not provide a direct benefit to you, the knowledge to be gained from this study will be used to better the future treatment of people with DID. Below is a summary of the research.

Aim of the study
The main issue that this study addresses is how memories transfer from one identity to another. People with DID often report their identities not possessing the same memories for past experiences. For example, some identities may have more vivid memories for negative experiences in the person's life. Other identities may not remember or may avoid thinking of, negative and distressing experiences. These identities may focus more on non-distressing memories or experiences in their daily life, they may experience increased numbness and may not fully recognize what has happened in the past. On the other hand, if they are aware of distressing experiences, it can feel as if they were not actually experienced by themselves.

To date little research has looked at how people with DID process information in different identities. This study investigates this. Specifically, it assesses the nature of identities that do remember distressing experiences and identities that have less knowledge of distressing experiences.

Procedure
Before you decide whether to participate in this study, the research process will be explained. The study will take place at either Belmont Private Hospital in Brisbane or the University of Canterbury in Christchurch. The study will be run a female researcher, Rosemary Marsh, who is working on a PhD with Prof Warwick Middleton and Assoc. Prof Martin Dorahy. You will complete some tasks associated with how your memory works, like hearing a story and repeating it back, hearing a word (e.g., bread) and thinking about what memory comes to mind, or seeing words on screen (e.g., happy, sad) and determine if they fit with how you see yourself. Some of these tasks will be done on a computer, but you will not need any familiarity with computers. In addition to these tasks you will be asked to fill in various questionnaires. We will now explain how to choose which identities are best to use in the study.

What is expected of you?
We request that you choose two identities to take part in this study. Please feel free to speak with your doctor about this. In choosing two identities, we'd ask you to make your choice with the following consideration in mind:
One identity you choose should have memories of experiencing distressing events from your past. The other identity should remember or feel disconnected from past distressing events, as if they happened to another person or identity.
Both identities should not be aware of the experiences and memories that the other has. That is, they don't share experiences or have the same memories, so when one identity experiences an event (e.g., driving to the supermarket), the other identity is not aware of it (i.e., not aware of driving to the supermarket, or has no memory of driving to the supermarket).

Each identity chosen should be able to come forward on request.
Each identity chosen should be able to engage in simple computer tasks.
Each identity chosen should be able to read.

Finally, we request that other identities who are not participating in the task should not influence or communicate with the identities involved in the tasks. That way we will be able to understand more about how the identities in the task learn and remember information.

If you decide to take part, you can have a support person or your Doctor present during the study in order to guide the transition between identities. The session will take approximately 90 minutes.

Treatment of data
Any information you provide us in this study will be kept confidential, meaning we cannot share your answers with your doctor or nurses. Only the researchers whose names are included in this letter will have access to your data. All information will be kept anonymous by ensuring your name is not on anything that contains information you provide in the study. All information will be put together with other people in the study. The results of the study may be published in a scientific journal, but no identifying information will be given. If you wish to obtain the overall results of this study, please contact Rosemary Marsh via the email address provided at the end of this letter.

Your participation in this study is completely voluntary. You can withdraw from the study at any time without having to provide a reason. This decision will have no influence on your treatment.

Participation in this study will have no health risk. The Human Ethics Committee of the University of Canterbury has passed this study as safe for human participation.

For your participation, you will receive a $10 shopping voucher and travel expenses will be reimbursed.

This project has been reviewed and approved by the University of Canterbury Human Ethics Committee, and participants should address any complaints to The Chair, Human Ethics Committee, University of Canterbury, Private Bag 4800, Christchurch (human-ethics@canterbury.ac.nz)

Contact Details
You are free to ask any further questions to Prof Warwick Middleton, Rosie Marsh (the researcher; University of Canterbury) at rosie.marsh@pg.canterbury.ac.nz

Regards,

Rosemary Marsh (PhD candidate, University of Canterbury)
Assoc. Prof Martin Dorahy (University of Canterbury)

Researchers contact details are as follows:

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Reply Slip

I consent to be contacted by a member of the Research team about the research project: ☐

Signed (participant): Date:

Print name (participant): Telephone:

Appendix A-2: Recruitment letter of Chapters two, three and four for DID clinicians

Information letter to clinicians regarding the study
"The Relationship between Memory Functioning and Dissociation"

Dear Dr.

We are conducting a study that examines the transfer of information across dissociative identities in dissociative identity disorder (DID).

The main aim will be to address how old memories as well as new memories that have just been formed transfer from one identity to another. To do this we are seeking to recruit individuals who have a diagnosis of DID, and run tem through a set of tasks that examine learning and memory in two different dissociative identities. We are asking that each of these identities not be aware of what the other's experience (i.e., interidentity amnesia), and that one identity has some memory of distressing experiences from the past, while the other identity is less aware of painful past experiences experiencing, or feels they have happened to other people or identities. We will not be asking people about any past events that have or may not have experienced, but simply want to assess two identities that have different psychological characteristics to see if they both process information similarly.

To date there has been little research looking at how people with DID process information in different identities, especially information about themselves.

If you agree, we'd be most grateful if you could give the attached invitation letter to any DID patient who may be interested in being involved. This letter contains all the details about the study. The session will take approximately 90 minutes.

This project has been reviewed and approved by the University of Canterbury Human Ethics Committee, and participants should address any complaints to The Chair, Human Ethics Committee, University of Canterbury, Private Bag 4800, Christchurch (human-ethics@canterbury.ac.nz)

Yours sincerely,

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Prof Simon Kemp
Research Psychologist
Phone: +64 3 364 2968
simon.kemp@canterbury.ac.nz

Chandele Butler
Honours Student
Phone: +64 27 812 2163
clb104@uclive.ac.nz

Appendix A-3: Recruitment letter of Chapters two, three and four for simulator participants

Information letter to clients regarding the study
"The Relationship between Memory Functioning and Dissociation"

We are writing to ask for your participation in research aimed at furthering the understanding of dissociative identity disorder (DID), a severe psychiatric condition once known as multiple personality disorder. We are seeking people who have acting experience or an interest in acting to simulate or role-play dissociative identity disorder while engaging in a series of tasks designed to look at how memory works. Below is a summary of the research.

Aim of the study
DID is characterized by the existence within the individuals of two or more identities or personalities that have different memories, feelings, behaviours and interaction styles. The main issue that this study addresses is how memories transfer from one identity to another. People with DID often report their identities not possessing the same memories for past experiences. For example, some identities may have more vivid memories for negative experiences in the person's life. Other identities may not remember or may avoid thinking of negative and distressing experiences. These identities may focus more on non-distressing memories or experiences in their daily life, they may experience increased numbness and may not fully recognize what has happened in the past. On the other hand, if they are aware of distressing experiences, it can feel as if they were not actually experienced by themselves.

To date little research has looked at how people with DID process information in different identities. This study investigates this. Specifically it assesses the nature of identities that do remember distressing experiences and identities that have less knowledge of distressing experiences. In order to compare the result from a group of people with DID, we are recruiting a group of people to role-play DID in order to see if there is a difference in memory functioning in the DID group versus the role-play group. You will be asked to create and role-play two different identities or personalities that exist inside you. We ask that one of the identities believes it has experienced and can remember painful or traumatic experiences from earlier in life, and the other identity has little or no awareness of such experiences. We'd also ask that the two identities believe they have no awareness of each other or shared memories.

Procedure
Before you decide whether to participate in this study, the research process will be explained. The study will take place at either the University of Canterbury or Belmont Private Hospital in Brisbane. If you are interested in being involved, you will complete a short survey by clicking on the link below. Then either Dr Greta Bond (Theatre & Film Studies), Chandele Butler (Dept of Psychology) or Martin Dorahy (Dept of Psychology) will contact you to arrange a time to get information on DID and watch a film on the condition. This will be done with other people taking part in the study. We will then ask you to practice being DID for approximately a week and then get information on the characteristics of the identities you practiced. Finally, you will role-play these identities while running through some task that look at memory functioning conducted in a lab in the Psychology Department with a female researcher (Rosemary Marsh), In the tasks you will hear a story and repeat it back, or hear a word (e.g., bread) and think about what memory comes to mind, or see words on a screen (e.g., happy, sad) and determine if they fit with how you see yourself. You will also be asked to fill in some questionnaires. You will engage in the task in one or the other of the identities

you are role-playing. Session one will take approximately 30 minutes and session two will take approximately 90 minutes.

Treatment of data
If you choose to take part any information you provide us will be kept confidential. Only the researchers whose names are included in this letter will have access to your data. All information will be kept anonymous by ensuring your name in not on anything that contains information you provide in the study. All the information will be put together with other people in the study. The results of the study may be published in a scientific journal, but no identifying information will be given.
Participation in this study will have no health risk. The Human Ethics Committee of the University of Canterbury has passed this study as safe for human participation.

For your assistance with this study you will received a $50 shopping voucher. The research who conducts the memory task will not be aware of which participants have DID and which are role-playing. She will rate each person doing the study on how authentic they appeared to have DID. The simulator/role-player with the highest score will get a further $50 shopping voucher.

Contact Details:
You are free to ask any further questions to Dr Greta Bond (Theatre & Film Studies), Chandele Butler (Dept of Psychology) or Dr Martin Dorahy (Dept of Psychology; 3643416 or martin.dorahy@canterbury.ac.nz.

If you are interested in participating, please click on the following web address:

Thank you

Chandele Butler
Phone: +64 27 812 2163
clb104@uclive.ac.nz

Rosemary Marsh
Phone: +64 27 951 5850
rosiemarsh1@gmail.com

Prof Warwick Middleton
Phone: +61 7 3831 4466
warmed@tpg.com.au

Prof Simon Kemp
Phone: +64 3 364 2968
simon.kemp@canterbury.ac.nz

Assoc. Prof Martin Dorahy
Phone: +64 3 364 3416
martin.dorahy@canterbury.ac.nz

Appendix A-4: Recruitment notice for Chapters two, three and four for control participants

Participants Wanted

You are invited to take part in a study which looks at how cognitive factors influence memory. Specifically, we are interested in whether old and recent memories are influenced by a person's level of cognitive functioning.

We require participants who are students at the University of Canterbury **aged between 30 and 65**. The study will involve completion of a combination of questionnaires and tasks, with the tasks requiring you to retrieve memories of events created during the study. These memories will be kept in the strictest confidence. The experiment will take between one and two hours and you will be given a $10 shopping voucher for your participation.

If you are interested in participating, please email Rosie at rosie.marsh@pg.canterbury.ac.nz for more information.

Regards,

Rosemary Marsh (PhD Candidate, University of Canterbury)

Assoc. Prof Martin Dorahy (University of Canterbury)

Prof. Simon Kemp (University of Canterbury)

Appendix A-5: Recruitment letter for DID participants for Chapter five

Information letter to clients regarding the study
"The Relationship between Memory Functioning and Dissociation"

We are writing to ask for your participation in research aimed at furthering the understanding of dissociative identity disorder (DID). While your insight into these issues may not provide a direct benefit to you, the knowledge to be gained from this study will be used to better the future treatment of people with DID. Below is a summary of the research.

Aim of the study
The main issue that this study addresses is the differences in how sense of self is constructed in different identities. People with DID often report the importance of previous events differently depending on the identity. For example, some identities may have more vivid memories for experiences in a person's life, while other identities may not remember these events or may not recall them as being so important.
To date little research has looked at how people with DID differ in their reporting of these memories and how this affects the construction of sense of self. Our study investigates this.

Procedure
Before you decide whether to participate in this study, the research process will be explained. The study will take place at either Belmont Private Hospital in Brisbane or the office of Warwick Middleton. The study will be run a female researcher, Rosie Marsh, who is completing a PhD alongside Prof. Warwick Middleton and Prof. Martin Dorahy. You will complete some tasks associated with how you describe yourself, like choosing words that describe yourself in certain situations and answering questions about self-selected important events from your past. In addition to these tasks you will be asked to fill in various questionnaires. We will now explain how to choose which identities are best to use in the study.

What is expected of you?
We request that you choose two identities to take part in this study. Please feel free to speak with your doctor about this. In choosing two identities, we'd ask you to make your choice with the following consideration in mind:
Each identity chosen should be able to come forward on request.
Each identity chosen should be able to engage in simple computer tasks.
Each identity chosen should be able to read.
One identity should be an adult that is aware of many events that occur.
One identity should be young, approximately aged between the ages of 8 and 12.

Finally, we request that other identities who are not participating in the task should not influence or communicate with the identities involved in the tasks. That way we will be able to understand more about how the identities in the task learn and remember information.

If you decide to take part, you are welcome to have a support person or your Doctor present during the study in order to guide the transition between identities. The session will take about two hours.

Treatment of data

Any information you provide us in this study will be kept confidential, meaning we cannot share your answers with your doctor or nurses. Only the researchers whose names are included in this letter will have access to your data. All information will be kept anonymous by ensuring your name is not on anything that contains information you provide in the study. All information will be put together with other people in the study. The results of the study may be published in a scientific journal, but no identifying information will be given. If you wish to obtain the overall results of this study, please contact Rosie Marsh via the email address provided at the end of this letter.

Your participation in this study is completely voluntary. You can withdraw from the study at any time without having to provide a reason. This decision will have no influence on your treatment.

Participation in this study will have no health risk. The Human Ethics Committee of the University of Canterbury has passed this study as safe for human participation.

For your participation, you will receive a $20 shopping voucher.

This project has been reviewed and approved by the University of Canterbury Human Ethics Committee, and participants should address any complaints to The Chair, Human Ethics Committee, University of Canterbury, Private Bag 4800, Christchurch (human-ethics@canterbury.ac.nz)

Regards,

Rosie Marsh (PhD candidate, University of Canterbury)
Prof. Martin Dorahy (University of Canterbury)

Researchers contact details are as follows:

Rosie Marsh
Phone: +64 27 951 5850
rosie.marsh@pg.canterbury.ac.nz

Assoc. Prof Martin Dorahy
Phone: +64 3 364 3416
martin.dorahy@canterbury.ac.nz

Prof Warwick Middleton
Phone: +61 7 3831 4466
warmid@tpg.com.au

Lenaire Seager
Phone: +61 7 3398 0111
lenaire.seager@healthecare.com.au

Prof Simon Kemp
Phone: +64 3 364 2968
simon.kemp@canterbury.ac.nz

Brooke Johnson
Phone: +64 27 504 9899
brooke.johnson@pg.canterbury.ac.nz

Reply Slip
I consent to be contacted by a member of the Research team about the research project: ☐

Signed (participant): Date:

Print name (participant): Telephone:

Appendix A-6: Recruitment notice for adult control participants for Chapter five

Participants Wanted

You are invited to take part in a study which looks at how people describe themselves. Specifically, we are interested in whether the reporting of life memories occurs in different groups of people.

We require participants who are students at the University of Canterbury **aged between 30 and 65**. The study will involve completion of a combination of questionnaires and tasks, with the tasks requiring you to retrieve memories of events that have occurred in your life and to describe how you see yourself. All information will be kept in the strictest confidence. The experiment will take between one and two hours and you will be given a $10 shopping voucher for your participation.

We are looking to recruit university students, so those on the STAR program are excluded from the study.

If you are interested in participating, please email Rosie at rosie.marsh@pg.canterbury.ac.nz for more information.

Regards,

Rosie Marsh (PhD Candidate, University of Canterbury)

Brooke Johnson (Masters Student, University of Canterbury)

Prof. Martin Dorahy (University of Canterbury)

Prof. Simon Kemp (University of Canterbury)

Appendix A-7: Recruitment notice for child control participants for Chapter five

Participants Wanted

Your child is invited to take part in a study which looks at how people describe themselves. Specifically, we are interested in how the reporting of life memories occurs in different groups of people.

We require participants who are **aged between 8 and 12**. The study will involve completion of a combination of tasks requiring participants to retrieve memories of events that have occurred in their life. These memories will be kept in the strictest confidence. The experiment will take between one and two hours and you will be given a $10 shopping voucher for participating.

If you are interested in allowing your child to participate, please email Rosie at rosie.marsh@pg.canterbury.ac.nz for more information.

Regards,

Rosie Marsh (PhD Candidate, University of Canterbury)

Brooke Johnson (Masters Student, University of Canterbury)

Prof. Martin Dorahy (University of Canterbury)

Prof. Simon Kemp (University of Canterbury)

Appendix B:

Information and consent forms

Appendix B-1: Information sheet for DID and Simulator participants for Chapters two, three and four

The Relationship between Memory Functioning and Dissociation

My name is Rosemary Marsh and I am a PhD Candidate in the Department of Psychology at the University of Canterbury. You are invited to take part the research project "The Relationship between Memory Functioning and Cognitive Factors".

The aim of this study is to investigate the extent to which memory is influenced by different types of tasks. In today's session, we will progress through a series of tasks that look at this. You will be required to fill out five questionnaires which will look at things like how much you daydream, whether you think of distressing things that may have happened to you, and whether you feel you have a good knowledge of who you are. You will also read through a series of stories to look at how you take in information. Some stories will have no emotional information in them; other stories will contain some emotional information. We are interested in eye movements associated with doing the tasks, so for some of them we will look at your eye movement. This will be done with a small camera that will be outside your line of vision so should distract you. We will do some task while you are in one identity, and other tasks while you are in another identity. So, I will ask you to switch between identities occasionally. I'd ask you now to consider which two identities are interested in taking part in the study. In giving this consideration, I'd ask you pick one that has no or only limited knowledge of any difficulty experiences you have had in the past, and the other that has knowledge of difficulty experiences in your life.

Tasks will be either done on a computer, in which case you'll respond pressing a button, or will be done by me asking you questions. For example, I might read out a word to you (e.g., sunshine) and ask you to tell a memory in your life that this word makes you recall. I will record your responses so we can add them to responses given by others and then analyse them.

Below is the schedule and time estimate for each part of today's session.

Questionnaires	30 minutes
Tasks and activities	60 minutes

For taking part in the project, you will receive a $20.00 shopping voucher. The study will take between 60-90 minutes to complete. If you want to stop at any time for a break or withdraw from the study, please let me know. There will be no negative penalty to you if you withdraw and you will still receive the participation voucher. Please note however, that information cannot be withdrawn from the project once it has been entered into the computer, as all information will be anonymised.

The results of this study may be published, but any information you provide us will be kept confidential. Your identity will not be made public without your prior consent. To ensure confidentiality no names will be used on the questionnaires or in the final report. Any and all information that has identifying features (such as the consent form) will be kept by Martin Dorahy, in his locked office. Only Rosemary Marsh, Martin Dorahy and Chandele Butler will have access to the data, which will be securely stored electronically by password protection.

After the conclusion of the experiment Martin Dorahy will keep a copy of the data for ten years, after which it will be destroyed. A thesis is a public document and will be available through the UC Library.

This project is being carried out as a requirement for an *Honours Research Project* by Chandele Butler and a *PhD* by Rosemary Marsh, under the supervision of Martin Dorahy, Warwick Middleton and Simon Kemp who can be contacted at the email addresses below. Rosemary, Chandele or Martin will be happy to address any concerns you have about participation in the project.

Contact details as follows:

Rosemary Marsh
Phone: +64 27 951 5850
rosiemarsh1@gmail.com

Chandele Butler
Phone: +64 27 812 2163
clb104@uclive.ac.nz

Assoc. Prof Martin Dorahy
Phone: +64 3 364 3416
martin.dorahy@canterbury.ac.nz

Prof Warwick Middleton
Phone: +61 7 3831 4466
warmed@tpg.com.au

Lenaire Seager
Phone: +61 7 3398 0111
lenaire.seager@healthcare.com.au

Prof Simon Kemp
Phone: +64 3 364 2968
simon.kemp@canterbury.ac.nz

This project has been reviewed and approved by the University of Canterbury Human Ethics Committee, and participants should address any complaints to The Chair, Human Ethics Committee, University of Canterbury, Private Bag 4800, Christchurch (human-ethics@canterbury.ac.nz)

Human Ethics Committee:
Email: human-ethics@canterbury.ac.nz

Appendix B-2: Information sheet for control participants for Chapters two, three and four

The Relationship between Memory Functioning and Dissociation

My name is Rosemary Marsh and I am a PhD Candidate in the Department of Psychology at the University of Canterbury. You are invited to take part the research project "The Relationship between Memory Functioning and Cognitive Factors".

The aim of this study is to investigate the extent to which memory is influenced by different types of tasks. In today's session, we will progress through a series of tasks that look at this. You will be required to fill out five questionnaires which will look at things like how much you daydream, whether you think of distressing things that may have happened to you, and whether you feel you have a good knowledge of who you are. You will also read through a series of stories to look at how you take in information. Some stories will have no emotional information in them; other stories will contain some emotional information. We are interested in eye movements associated with doing the tasks, so for some of them we will look at your eye movement. This will be done with a small camera that will be outside your line of vision so should distract you. Some tasks that we will do look similar to each other, while other tasks will be quite different.

Tasks will be either done on a computer, in which case you'll respond pressing a button, or will be done by me asking you questions. For example, I might read out a word to you (e.g., sunshine) and ask you to tell a memory in your life that this word makes you recall. I will record your responses so we can add them to responses given my other and analyse them.

Below is the schedule and time estimate for each part of today's session.

Questionnaires	30 minutes
Tasks and activities	60 minutes

For taking part in the project, you will receive a $10.00 shopping voucher. The study will take between 60-90 minutes to complete. If you want to stop at any time for a break or withdraw from the study, please let me know. There will be no negative penalty to you if you withdraw and you will still receive the participation voucher. Please note however, that information cannot be withdrawn from the project once it has been entered into the computer, as all information will be anonymised.

The results of this study may be published, but any information you provide to us will be kept confidential. Your identity will not be made public without your prior consent. To ensure confidentiality no names will be used on the questionnaires or in the final report. Any and all information that has identifying features (such as the consent form) will be kept by Martin Dorahy, in his locked office. Only Rosemary Marsh, Martin Dorahy and Chandele Butler will have access to the data, which will be securely stored electronically by password protection. After the conclusion of the experiment Martin Dorahy will keep a copy of the data for ten years, after which it will be destroyed. A thesis is a public document and will be available through the UC Library.

This project is being carried out as a requirement for an *Honours Research Project* by Chandele Butler and a *PhD* by Rosemary Marsh, under the supervision of Martin Dorahy,

Warwick Middleton and Simon Kemp who can be contacted at the email addresses below. Rosemary, Chandele or Martin will be happy to address any concerns you have about participation in the project.

Contact details as follows:

Rosemary Marsh
Phone: +64 27 951 5850
rosiemarsh1@gmail.com

Chandele Butler
Phone: +64 27 812 2163
clb104@uclive.ac.nz

Assoc. Prof Martin Dorahy
Phone: +64 3 364 3416
martin.dorahy@canterbury.ac.nz

Prof Warwick Middleton
Phone: +61 7 3831 4466
warmed@tpg.com.au

Lenaire Seager
Phone: +61 7 3398 0111
lenaire.seager@healthcare.com.au

Prof Simon Kemp
Phone: +64 3 364 2968
simon.kemp@canterbury.ac.nz

This project has been reviewed and approved by the University of Canterbury Human Ethics Committee, and participants should address any complaints to The Chair, Human Ethics Committee, University of Canterbury, Private Bag 4800, Christchurch (human-ethics@canterbury.ac.nz)

Human Ethics Committee:
Email: human-ethics@canterbury.ac.nz

Appendix B-3: Information sheet for DID participants for Chapter five

The Relationship between Memory Functioning and Dissociation

My name is Rosie Marsh and I am a PhD Candidate in the Department of Psychology at the University of Canterbury in Christchurch, New Zealand. You are invited to take part the research project "The Relationship between Memory Functioning and Dissociation".

The aim of this study is to investigate the extent to which memories and sense of self are constructed in people with Dissociative identity disorder (DID) and psychosis. In the session, we will progress through a series of tasks that look at this. You will be required to fill out a series of questionnaires which will look at whether you feel you have a good knowledge of who you are. You will also be asked to identify words that describe how you would describe yourself in different day-to-day situations. You will also be asked to recall some memories from your past. Some tasks that we will do look similar to each other, while other tasks will be quite different.

Questionnaires and tasks will be either done on a computer, in which case you'll respond pressing a button, or will be done by me asking you questions. I will record your responses so we can add them to responses given by others and analyse them.

Below is the schedule and time estimate for each part of today's session.

- Questionnaires 30 minutes
- Tasks and activities 90 minutes

For taking part in the project, you will receive a $20.00 shopping voucher. The study will take around 120 minutes to complete. If you want to stop at any time for a break or to withdraw from the study, please let me know. There will be no negative penalty to you if you withdraw and you will still receive the participation voucher. Please note however, that information cannot be withdrawn from the project once it has been entered into the computer, as all information will be anonymised.

The results of this study may be published, but you can be assured of the complete confidentiality of data gathered. Your identity will not be made public without your prior consent. To ensure confidentiality no names will be used on the questionnaires or in the final report. Any and all information that has identifying features (such as the consent form) will be kept by Martin Dorahy, in his locked office. Only Rosie Marsh, Martin Dorahy and Brooke Johnson will have access to the data, which will be securely stored electronically by password protection. After the conclusion of the experiment Martin Dorahy will keep a copy of the data for ten years, after which it will be destroyed. A thesis is a public document and will be available through the UC Library.

This project is being carried out as a requirement for a *Masters thesis* by Brooke Johnson and a *PhD* by Rosie Marsh, under the supervision of Martin Dorahy, Warwick Middleton and Simon Kemp who can be contacted at the email addresses below. Rosemary, Brooke or Martin will be happy to address any concerns you have about participation in the project.

Contact details as follows:

- Rosie Marsh
  Phone: +64 27 951 5850
  rosiemarsh1@gmail.com

- Brooke Johnson
  Phone: +64 27 504 9899

  brooke.johnson@pg.canterbury.ac.nz

- Prof Martin Dorahy
  Phone: +64 3 364 3416
  martin.dorahy@canterbury.ac.nz

- Prof Warwick Middleton
  Phone: +61 7 3831 4466
  warmid@tpg.com.au

- Lenaire Seager
  Phone: +61 7 3398 0111
  lenaire.seager@healthecare.com.au

- Prof Simon Kemp
  Phone: +64 3 364 2968
  simon.kemp@canterbury.ac.nz

This project has been reviewed and approved by the University of Canterbury Human Ethics Committee, and participants should address any complaints to The Chair, Human Ethics Committee, University of Canterbury, Private Bag 4800, Christchurch (human-ethics@canterbury.ac.nz)

- Human Ethics Committee:

Postal: Okeover House, University of Canterbury, Ilam, 8041, Christchurch
Email: human-ethics@canterbury.ac.nz

Appendix B-4: Information sheet for adult control participants for Chapter five

The Relationship between Memory Functioning and Dissociation

My name is Rosie Marsh and I am a PhD Candidate in the Department of Psychology at the University of Canterbury. You are invited to take part the research project "The Relationship between Memory Functioning and Dissociation".

The aim of this study is to investigate the extent to which memories and sense of self are constructed in people with Dissociative identity disorder (DID), psychosis and non-clinical controls. In the session, we will progress through a series of tasks that look at this. You will be required to fill out a series of questionnaires which will look at whether you feel you have a good knowledge of who you are. You will also be asked to identify words that describe how you would describe yourself in different day-to-day situations. You will also be asked to recall some memories from your past. Some tasks that we will do look similar to each other, while other tasks will be quite different.

Tasks will be either done on a computer, or will be done by me asking you questions. I will record your responses so we can add them to responses given by others and analyse them.

Below is the schedule and time estimate for each part of today's session.

Questionnaires	30 minutes
Tasks and activities	60 minutes

For taking part in the project, you will receive a $10.00 shopping voucher. The study will take between 60-90 minutes to complete. If you want to stop at any time for a break or to withdraw from the study, please let me know. There will be no negative penalty to you if you withdraw and you will still receive the participation voucher. Please note however, that information cannot be withdrawn from the project once it has been entered into the computer, as all information will be anonymised.

The results of this study may be published, but you can be assured of the complete confidentiality of data gathered. Your identity will not be made public without your prior consent. To ensure confidentiality no names will be used on the questionnaires or in the final report. Any and all information that has identifying features (such as the consent form) will be kept by Martin Dorahy, in his locked office. Only Rosie Marsh, Martin Dorahy and Brooke Johnson will have access to the data, which will be securely stored electronically by password protection. After the conclusion of the experiment Martin Dorahy will keep a copy of the data for ten years, after which it will be destroyed. A thesis is a public document and will be available through the UC Library.

This project is being carried out as a requirement for a *Master's thesis* by Brooke Johnson and a *PhD* by Rosie Marsh, under the supervision of Martin Dorahy, Warwick Middleton and Simon Kemp who can be contacted at the email addresses below. Rosemary, Brooke or Martin will be happy to address any concerns you have about participation in the project.

Contact details as follows:

Rosie Marsh
Phone: +64 27 951 5850
rosie.marsh@pg.canterbury.ac.nz

Brooke Johnson
Phone: +64 27 504 9899
brooke.johnson@pg.canterbury.ac.nz

Prof Martin Dorahy
Phone: +64 3 364 3416
martin.dorahy@canterbury.ac.nz

Prof Warwick Middleton
Phone: +61 7 3831 4466
warmid@tpg.com.au

Lenaire Seager
Phone: +61 7 3398 0111
lenaire.seager@healthecare.com.au

Prof Simon Kemp
Phone: +64 3 364 2968
simon.kemp@canterbury.ac.nz

This project has been reviewed and approved by the University of Canterbury Human Ethics Committee, and participants should address any complaints to The Chair, Human Ethics Committee, University of Canterbury, Private Bag 4800, Christchurch (human-ethics@canterbury.ac.nz)

Human Ethics Committee:
Postal: Okeover House, University of Canterbury, Ilam, 8041, Christchurch
Email: human-ethics@canterbury.ac.nz

Appendix B-5: Information sheet for child controls for Chapter five

The Relationship between Memory Functioning and Dissociation

My name is Rosie and I am doing Psychology at the University of Canterbury. You are invited to take part a project about memory.

We want to see whether people's memories are linked to how they feel about themselves. We are interested in the differences between children and adults. In the session, we will do some tasks that look at this. You will do some questionnaires which look at whether you feel you know who you are. You will also be asked to tell me some memories you have about events that occurred in the past.

Time for today's tasks:

Questionnaires	30 minutes
Tasks and activities	15 minutes

You will get a $10.00 shopping voucher for taking part. If you want to stop at any time for a break or to finish early, please let me know. This is absolutely fine and you will still receive the participation voucher if you finish early. It can be difficult to delete your information once it is in the computer so let us know early if you don't want us to use anything.

The results of this study may be published, but no one will know your answers are yours except for Rosie. Your name made public without asking you first. The assent form which has your name on it will be kept by Martin Dorahy, in his locked office. Only Rosie Marsh, Brooke Johnson and Martin Dorahy will have access to the things you say and it will be kept safe on a computer that has a password. When the study finishes, Martin Dorahy will keep the data for ten years, after which it will be destroyed. The overall findings will be available in print through the UC Library.

This project is being carried out for university studies by Brooke Johnson and Rosie Marsh, under the supervision of Martin Dorahy, Warwick Middleton and Simon Kemp who can be contacted at the email addresses below. Rosie, Brooke or Martin are happy to address any questions you have about taking part in the project.

Contact details as follows:

Rosie Marsh
Phone: +64 27 951 5850
rosie.marsh@pg.canterbury.ac.nz

Brooke Johnson
Phone: +64 22 078 2070
brooke.johnson@pg.canterbury.ac.nz

Prof. Martin Dorahy
Phone: +64 3 364 3416
martin.dorahy@canterbury.ac.nz

Prof. Warwick Middleton
Phone: +61 7 3831 4466
warmed@tpg.com.au

Lenaire Seager
Phone: +61 7 3398 0111
lenaire.seager@healthcare.com.au

Prof. Simon Kemp
Phone: +64 3 364 2968
simon.kemp@canterbury.ac.nz

This project has been approved by the University of Canterbury Human Ethics Committee. If you have any complaints about the tasks, please write to Secretary, Human Ethics Committee, Level 5, Matariki South, University of Canterbury, Christchurch, New Zealand (human-ethics@canterbury.ac.nz)

Appendix B-6: Information sheet for parents of child controls for Chapter five

The Relationship between Memory Functioning and Dissociation

My name is Rosie Marsh and I am a PhD Candidate in the Department of Psychology at the University of Canterbury. Your child is invited to take part the research project "The Relationship between Memory Functioning and Dissociation" as a control participant (i.e. they have never received a diagnosis of dissociative identity disorder (DID) or had experiences with psychosis).

The aim of this study is to investigate the extent to which memories and sense of self are constructed in people with dissociative identity disorder (DID), psychosis and non-clinical controls. We will progress through a series of tasks that look at this. Your child will be required to complete a series of questionnaires which will look at whether they feel they have a good knowledge of who they are. They will also be asked to recall some memories from their past. Children are welcome to have a support person present during the session.

Below is the schedule and time estimate for each part of the session.

Questionnaires	30 minutes
Tasks and activities	15 minutes

For taking part in the project, your child will receive a $10.00 shopping voucher. The study will take 40 minutes to complete. If you or your child wants to stop at any time for a break or to withdraw from the study, they are able to let me know. There will be no negative penalty to either of you if you withdraw and your child will still receive the participation voucher. Please note however, that information cannot be withdrawn from the project once it has been entered into the computer, as all information will be anonymised.

The results of this study may be published, but you can be assured of the complete confidentiality of data gathered. Your child's identity will not be made public without your prior consent. To ensure confidentiality no names will be used on the questionnaires or in the final report. Any and all information that has identifying features (such as the consent form) will be kept by Martin Dorahy, in his locked office. Only Rosie Marsh, Brooke Johnson and Martin Dorahy will have access to the data which will be securely stored electronically by password protection. After the conclusion of the experiment Martin Dorahy will keep a copy of the data for ten years, after which it will be destroyed. A thesis is a public document and will be available through the UC Library.

This project is being carried out as a requirement for a *Master's thesis* by Brooke Johnson and a *PhD* by Rosie Marsh, under the supervision of Martin Dorahy, Warwick Middleton and Simon Kemp who can be contacted at the email addresses below. Rosie, Brooke or Martin will be happy to address any concerns you have about participation in the project.

Contact details as follows:

Rosie Marsh
Phone: +64 27 951 5850
rosie.marsh@pg.canterbury.ac.nz

Brooke Johnson
Phone: +64 22 078 2070
brooke.johnson@pg.canterbury.ac.nz

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Phone: +64 3 364 3416
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Lenaire Seager
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Prof. Simon Kemp
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This project has been reviewed and approved by the University of Canterbury Human Ethics Committee, and participants should address any complaints to Secretary, Human Ethics Committee, Level 5, Matariki South, University of Canterbury, Christchurch, New Zealand (human-ethics@canterbury.ac.nz)

Appendix B-7: Consent form for Chapters two, three, four and five

Consent Form

Names of researchers:

Martin Dorahy (Clinical Psychologist/Assoc. Prof, University of Canterbury);
Rosemary Marsh (PhD Candidate, University of Canterbury);
Rafaele Huntjens (Assoc. Prof, University of Groningen);
Chandele Butler (Honours Student, University of Canterbury);
Simon Kemp (Professor, University of Canterbury),
Warwick Middleton (Professor, Belmont Private Hospital);
Lenaire Seager (Nurse Manager, Belmont Private Hospital).

	Please initial
I have been given a full explanation of this project and have had the opportunity to ask questions.	
I understand what is required of me if I agree to take part in the research.	
I understand that participation is voluntary and I may withdraw at any time without penalty. Withdrawal of participation will also include the withdrawal of any information I have provided should this remain practically achievable.	
I understand that should I complete the project my individual data will be merged with data from other participants.	
I understand that my memories will be recorded.	
I understand that any information or opinions I have provided will be kept confidential to the researcher Rosemary Marsh, and that any published or reported results will not identify the participants. I understand that a thesis is a public document and will be available through the UC Library.	
I understand that all data collected for the study will be kept in locked and secure facilities and in password protected electronic form and will be destroyed after five years.	
I understand the risks associated with taking part and how they will be managed.	
I understand that I am able to receive a report on the findings of the study by contacting the researcher at the conclusion of the project.	
I understand that I can contact Rosemary Marsh (rosiemarsh1@gmail.com) or Martin Dorahy (martin.dorahy@canterbury.ac.nz) for further information. If I have any complaints, I can contact the Chair of the University of Canterbury Human Ethics Committee, Private Bag 4800, Christchurch (human-ethics@canterbury.ac.nz)	
By signing below, I agree to participate in this research project.	

_____ _____ _____

Name of Participant Signature Date

Appendix B-8: Debrief sheet for DID and simulator participants for Chapters two, three and four

The Relationship between Memory Functioning and Dissociation
Debriefing Form

This study is interested in the memory functioning of people with dissociative identity disorder and those without a mental disorder. In order to understand this relationship, we asked for information about your levels of dissociation and post-traumatic stress using the Dissociative Experiences Scale - II (a measure of dissociation), the Dissociative Beliefs about Memory Measure (a measure of a person's belief about the role of memory in their life), the Post-Traumatic Stress Disorder Symptom Scale (a measure of PTSD) and the 20-item Somatoform Dissociation Questionnaire (a measure of physical dissociation).

We also sought information related to the difference between memories that people are aware of and those that they are not aware of (explicit and implicit memories, respectively). People with dissociation sometimes report being unable to remember certain memories in one identity, whereas they are easily remembered in another identity. Due to this, we used a series of tasks to see if memories created during the study and those recalled from the past were explicitly and implicitly recalled. We were also interested in how the emotional content of memories influences recall. We used the narratives from the first task to assess this by incorporating shameful events into a few of the stories.

We were also interested in the effect of dissociation and trauma on your sense of self (your beliefs about yourself and who you are). We altered the self-referential information available during events. In task two, some identities were required to talk about how much they identified with certain famous people. Some identities were required to write their name on a drawing of theirs. This increased how much of their self-concept was engaged in the event.

If you feel the need to talk to anyone about the effect this study has had on you, you are welcome to talk further to Rosemary Marsh or Martin Dorahy, via the contact details provided below. Your medical practitioners will also be free to talk about any thoughts you have regarding this study.

Contact details for the researchers are as follows:

Rosemary Marsh
Phone: +64 27 951 5850
rosiemarsh1@gmail.com

Martin Dorahy
Phone: +64 3 364 3416
martin.dorahy@canterbury.ac.nz

Thank you for your participation.

Regards,

Rosemary Marsh (PhD Candidate, University of Canterbury)

Assoc. Prof Martin Dorahy (University of Canterbury)

Prof Simon Kemp (University of Canterbury)

Appendix B-9: Debrief sheet for control participants for Chapters two, three and four

The Relationship between Memory Functioning and Dissociation
Debriefing Form

This study is interested in the memory functioning of people with dissociative identity disorder and those without a mental disorder. In order to understand this relationship, we asked for information about your levels of dissociation and post-traumatic stress using the Dissociative Experiences Scale - II (a measure of dissociation), the Dissociative Beliefs about Memory Measure (a measure of a person's belief about the role of memory in their life), the Post-Traumatic Stress Disorder Symptom Scale (a measure of PTSD) and the 20-item Somatoform Dissociation Questionnaire (a measure of physical dissociation).

We also sought information related to the difference between memories that people are aware of and those that they are not aware of (explicit and implicit memories, respectively). People with dissociation sometimes report being unable to remember certain memories in one identity, whereas they are easily remembered in another identity. Due to this, we used a series of tasks to see if memories created during the study and those recalled from the past were explicitly and implicitly recalled. We were also interested in how the emotional content of memories influences recall. We used the narratives from the first task to assess this by incorporating shameful events into a few of the stories.

We were also interested in the effect of dissociation and trauma on your sense of self (your beliefs about yourself and who you are). We altered the self-referential information available during events. In task two, some people were required to talk about how much they identified with certain famous people. Some people were required to write their name on a drawing of theirs. This increased how much of their self-concept was engaged in the event.

If you feel the need to talk to anyone about the effect this study has had on you, you are welcome to talk further to Rosemary Marsh or Martin Dorahy, via the contact details provided below.

Contact details for the researchers are as follows:

Rosemary Marsh
Phone: +64 27 951 5850
rosiemarsh1@gmail.com

Martin Dorahy
Phone: +64 3 364 3416
martin.dorahy@canterbury.ac.nz

Thank you for your participation.

Regards,

Rosemary Marsh (PhD Candidate, University of Canterbury)

Assoc. Prof Martin Dorahy (University of Canterbury)

Prof. Simon Kemp (University of Canterbury)

Appendix B-10: Debrief sheet for Chapter five

The Relationship between Memory Functioning and Dissociation
Debriefing Form

This study was interested in the memory functioning and sense of self construction of people with dissociative identity disorder (DID), psychosis, and those without a mental disorder. In order to understand this relationship we asked for information about your levels of dissociation and self-concept using the Dissociative Experiences Scale - II (DES-II) (a measure of dissociation), the Self Concept Clarity Scale (SCCS) (a measure of the clarity of self concept), the Scale to assess Meaning Making, Identity Style Inventory – 5 (ISI-5) (processing of information associated with a person's identity), Thinking About Life Experiences Scale (TALE) (assessment of autobiographical memories) and Diachronic Disunity Scale (DDS).

We also sought information related to the difference between younger and older identities in DID and their comparability to similar ages in psychosis and control groups. Specifically, we were interested in whether there were structural variations in the way that memories and self were reported. We are also interested in learning whether the ways identities in DID describe themselves are similar or different both within the identity and between different identities. In addition, we are interested in the clarity of a person's self-concept and the relationship there is to autobiographical memories.

If you feel the need to talk to anyone about the effect this study has had on you, you are welcome to talk further to Rosie Marsh, Brooke Johnson or Martin Dorahy, via the contact details provided below. Your medical practitioners will also be free to talk about any thoughts you have regarding this study. Additional outside support can be gained from Lifeline Aotearoa in the form of an anonymous and confidential telephone counselling service (0800 543 354).

Contact details for the researchers are as follows:

Rosie Marsh
Phone: +64 27 951 5850
rosie.marsh@pg.canterbury.ac.nz

Brooke Johnson
Phone: +64 27 504 9899
brooke.johnson@pg.canterbury.ac.nz

Martin Dorahy
Phone: +64 3 364 3416
martin.dorahy@canterbury.ac.nz

Thank you for your participation.

Regards,
Rosie Marsh (PhD Candidate, University of Canterbury), Brooke Johnson (Masters student, University of Canterbury), Prof. Martin Dorahy (University of Canterbury), Prof. Warwick Middleton (Belmont Hospital), Prof. Simon Kemp (University of Canterbury).

Appendix C

Simulator Training Resources

Appendix C-1: Simulator experience disclosure sheet for Chapters two, three and four

Participant Information Sheet

Please fill in the following:

Identification code: _____

Gender: _____

Age (in years): _____

Primary discipline of study (e.g. Psychology, drama): _____

Education background (What is the highest qualification you have gained? E.g. NCEA, undergraduate degree…):_____

How much acting experience have you had (in years)? _____

How would you describe your acting experience?

a) Professional
b) Amateur

How would you describe your prior knowledge of Dissociative Identity Disorder?

Very Knowledgeable	Some Knowledge	Little Knowledge	No Knowledge
E.g. completed a course that covers DID	E.g. have a basic understanding of DID	E.g. heard of the disorder	E.g. never heard of the disorder

Have you been diagnosed with any psychological disorder? (pls. circle): No Yes

If yes, was it related to trauma you have experienced in your life? (pls circle): No Yes

Have you ever had any visual, memory and attention problems? (pls circle): No Yes

Do you have a history of sexual abuse/assault? No Yes

Email address:

(This will allow you to be contacted for feedback after the study and organise payment for your participation)

Appendix C-2: Information about DID for simulators for Chapters two, three and four

Introduction

Dissociative Identity Disorder (DID) (known in the past as Multiple Personality Disorder-MPD) is a complex psychological disorder now understood to be the result of complicated biological, psychological and social factors, including the experience of severe trauma in early childhood, like repeated physical, sexual, and/or emotional abuse.

Q: How Do the Identities of DID Develop?

When faced with an overwhelming situation from which there is no physical escape, a child may learn to "go away" in his or her head. Children typically use this ability as a defense against physical and emotional pain, or fear of that pain. By dissociating, thoughts, feelings, memories, and perceptions of the trauma can be separated off in the mind. Until about the age of eight or nine years, children are developmentally primed for fantasy play, such as when they create and interact with imaginary “friends”. When under extreme stress, young children may call on this special ability to develop a “character” or “role” into which they can escape when feeling threatened. One therapist described this as nothing more than a little girl imagining herself on a swing in the sunshine instead of at the hands of her abuser. Repeated dissociation can result in a series of separate entities, or mental states, which may eventually take on identities of their own. These entities can become the internal "personality states" of DID. Changing between these states of consciousness is often described as "switching".

Q: Do People Actually Have “Multiple Personalities”?

Yes and no. One of the reasons for the decision to change the disorder's name from MPD to DID is that "multiple personalities" is a misleading term. A person with DID feels as if he or she has within them two or more identities, each with its own way of thinking and remembering about the person and their life. These identities or personalities have been called "alters," "parts," "states of consciousness," or "ego states." It is important to keep in mind that although these alternate states may feel or appear to be very different, they are all manifestations of a single person.

Q: Is it Obvious when a Person Switches Personalities?

Unlike popular portrayals of dissociative identities in books and movies, most people with DID work hard to hide their dissociation. There is also a lot of variation in switching between identities. For some the switch is very subtle and not that noticeable, for others there is a distinct change in the person’s body posture, demeanour, use of language and interaction style. Switching often occurs quite quickly, over a few seconds or a little longer. People with DID can often function so well, especially under controlled circumstances, that family members, co-workers, neighbours, and others with whom they interact daily may not know that they are chronically dissociative. People with DID can hold highly responsible jobs, contributing to society in a variety of professions, the arts, and public service.

Q: What Are the Symptoms of Dissociative Identity Disorder?

The main symptom of DID is having, and switching between, different identity states that have their own memories, emotions, behaviours and experiences in life. These identity states also often differ in their knowledge base (e.g., one may know French and another may not) and idiosyncrasies (e.g., accent, body posture, interpersonal interaction style; for example, one person might be shy, and another more playful or confident). Another core symptom of DID is the inability to remember important event in the person's life, this is called amnesia. Often people with DID are unaware of what is happening while another idebtity is in control of their body and mind therefore they cannot remember what happened when that identity interacted with the world. This often means that identities are not aware of each other, like two different people operating in the same body with no knowledge of each other and no memories for what has haappened when the other is in control. People with DID can also experience out-of-body-episodes (e.g., feeling detached from themselves), time loss, and trance states. Often they also experience anxiety, depression and report hearing voices, that are thought to be the other identity or identities speak.

Q: Is DID a Major Mental Health Problem?

Current research shows that DID may affect 1% of the general population and as many as 5-20% of people in psychiatric hospitals. These statistics put DID in the same category as schizophrenia, as one of the major mental health problems today.

Q: Can Dissociative Disorders Be Cured?

Yes. DID can respond well to individual psychotherapy, or "talk therapy,". Other therapies that might also be helpful include medications, hypnotherapy, and art or movement therapy. The course of treatment is long-term, intensive, and painful, as it generally involves remembering and reclaiming the dissociated traumatic experiences. Ultimately, the "alters" or "parts" can merge into a single whole "personality," reclaiming the awareness, identity, and history previously held by the individual parts.

Appendix C-3: Identity description sheet for Chapters two, three and four

Character Description Sheet

Fill out the following questions to develop an identity or character
What situation would draw this identity or character out in your life?

What is the purpose/function of this identity/character in your life?
(How does this identity help you?)
Name:
Age:

Physical Descriptions
Gender:
Height:
Weight:
Hair colour:
Eye colour:

More Details
Occupation:
Socioeconomic status:
Education:

Hobbies:

Interests:

Personality style:

Personal History:
(Has this identity experienced any traumatic events?)

Describe two incidents were this identity has interacted with other people

Family Life
Describe your family/family life:

If applicable
Marital status:
Children:

Additional
How would this identity/character act when involved in a study or experiment?

NOTE:
Although the created identities are aspects of the same individual they do NOT know each other. It is as if they are to separate people/characters.

Please portray identities as you see fit, but try to behave as though you and your other identity/character are unaware of each other's experiences.

Try not to remember anything that your other identity/character has experienced. Perform all tasks as if it is the first time you are experiencing them; this is called simulated amnesia.

Appendix C-4: Practice Logbook for Chapters two, three and four

Please document the amount of time (minutes) you have spent practicing simulating DID

Name:

Today's date:

	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday	Sunday
0-10							
11-20							
21-30							
31-40							
41-50							
51-60							
61-70							
71-80							
81-90							
90+							

Appendix C-5: Guide to develop simulator identity for Chapters two, three and four

Practice Instructions

Guide to developing and rehearsing your second identity character

Internal Characterization:

1. Invent and learn all the details of the second identity – not restricting yourself to the guidelines given.
    a. How is the character oriented towards other people? For example:
        i. Is he/she respectful towards people in authority or disrespectful;
        ii. Is he/she sociable, offering information easily to others, or private and introverted?
        iii. How does he/she respond to conflict?

    b. What is his/her relationship like with the people in his/her life? For example (where appropriate):
        i. Parents;
        ii. Siblings;
        iii. Children;
        iv. Friends;
        v. Co-workers;
        vi. Employers;
        vii. Neighbours

    c. Think about important events in his/her life. Create memories for the identity. For example:
        i. Their most distressing or traumatic memory.
        ii. Times she/he remembers being happiest/saddest/most content/most afraid/most embarrassed.

Note: While this material may not be explicitly used, there is no such thing as knowing your second identity character too well.

External Characterization:

2. How does the second identity character move?
    a. How does he/she stand; sit; move his/her hands; cross his/her legs?
    b. Does he/she gaze directly at other people, or tend to look away?
    c. Does he/she lean into or away from other people when talking?
    d. Does he/she have any tics or physical habits, for example, playing with hair; fiddling with fingers; cracking knuckles; biting fingernails?
    e. What sort of clothes does he/she prefer to wear?

Note: rehearse this physical identity by trying it on. Go about your everyday tasks "in character". Sit, stand, walk. Ideally this can become almost second nature.

Objectives:

3a. What does he or she want from other people? For example:

i. to be loved
ii. to be praised and accepted
iii. to be ignored and left alone
iv. not to be hurt
v. to be desired
vi. to be in control
vii. to be looked after

b. What strategies does s/he use to achieve this? For example:
i. by flattery
ii. by trying to please
iii. by sitting very still
iv. by flirting
v. by aggression
vi. by submission
vii. by presenting him/herself as : competent; incompetent; meek; respectful; disrespectful; in control; out of control?

Note: Ideally the secondary identity character never speaks or acts without you (the actor) knowing exactly what it is the character wishes to achieve by this behaviour (even if that is not visible to anyone else)

Transitions:

4. Rehearse moving between your own identity and the second identity character.
a. Pay attention to the way the physical characteristics of this character differs from your usual behaviour.
b. Change back and forth; try attempting the same tasks as each different character.
c. Watch yourself "transitioning" in front of a mirror.
d. It may help to take some time to observe strangers in a café or library – see how different people hold themselves differently, have different tics or gestures, speak differently. Try and see what you can imagine about them from these observed physical actions: your task, ideally, is to make your second identity character as fully realised and believable to an outsider as a "real" other person.

Appendix C-6: DID Knowledge Test for Chapters two, three and four

Dissociative Identity Disorder Knowledge Test

Please answer the following questions with True or False

1. Dissociative Identity Disorder (DID) was previously known as Multiple Personality Disorder (MPD). (True)

2. DID is understood to be the result of complicated biological, psychological and social factors. (True)

3. Only physical abuse in early childhood results in DID. (False)

4. Children develop a “character” or “role” as a defence against pain, or fear of pain to escape when feeling threatened. (True)

5. Trauma can be separated off in the mind by dissociating thoughts, feelings and memories. (True)

6. Individuals with DID often refer to themselves as “I” instead of “we”. (False)

7. Repeated dissociation can result in a series of separate entities, or mental states, which may eventually take on identities of their own. (True)

8. Changing between states of consciousness is often described as "converting" rather than “switching”. (False)

9. Identities or personalities have been called "alters," "parts," "states of consciousness," or "ego states”. (True)

10. In DID, different identities are all manifestations of a single person. (True)

11. Switching between identities is the same *for all individual with DID* involving a distinct change in the person’s body posture, demeanour, use of language and interaction style. (False)

12. Different identity states that have their own memories, emotions, behaviours, experiences in life and knowledge base. (True)

13. A core symptom of DID is the inability to remember important event in the person’s life, this is called amnesia. (True)

14. It would be unusual for people with DID to experience out-of-body-episodes, time loss, and/or trance states. (False)

15. People with DID are unable to hold responsible jobs or contribute to society. (False)

Appendix C-7: Simulator checklist: Knowledge of Character for Chapters two, three and four

Identification code:

Character Description/Background	Yes/No
Name	
Age	
Height	
Weight	
Hair Colour	
Eye Colour	
Occupation	
Socioeconomic status	
Education	
Hobbies	
Interests	
Personality Style	
Personal History	
Interaction with other people	
Family Life	
Marital Status	
Children	
Situations that bring out the identity	
Function/Purpose	
Behave in an experiment	

Appendix C-8: Simulators Feedback and Motivation Questionnaire for Chapters two, three and four

1. How well do you believe you successfully simulated DID?

Very poor Poor Average Good Excellent

2. To what degree do you believe you successfully convinced the researcher you had DID?

Definitely Not Probably Not Maybe Probably Definitely

3. Did you feel motivated to successfully mimic DID in this study?

Not at all Somewhat Quite a lot Completely

4. Do you believe the researcher thought you had DID?

Not at all Somewhat Quite a lot Completely

5. Did the information and coaching provided allow you to successfully simulate DID?

Not at all Somewhat Quite a lot Completely

6. What else might be helpful in assisting other participants to successfully simulate DID?

_____

7. Do you feel you spent enough time practicing simulating DID? Yes No

8. Did you come across any obstacles that prevented you from simulating DID to the best of your ability? (e.g. illness, not enough direction, university commitments, work, etc..) Yes No

9. Was the training period of 1 week sufficient time to effectively learn and practice simulating DID? Yes No

If no, how much time do you feel would be necessary?_____

Appendix D

Survey Measures

Appendix D-1: Dissociative Disorders Interview Schedule

DDIS

1. Have you ever felt like there were two or more distinct identities each which have their own pattern of perceiving, thinking and relating to the self and others?
   YES NO UNSURE

2. Do at least two of the identities or personalities recurrently take control of your behaviour?
   YES NO UNSURE

3. Have you experienced inability to recall important personal information that is too extensive to be explained by ordinary forgetfulness?
   YES NO UNSURE

4. Is this problem with different identities or personalities due to substance abuse e.g. alcohol blackouts or a genuine medical condition?
   YES NO UNSURE

Appendix D-2: Dissociative Experiences Scale – II

DES-II

These questions describe experiences that you may have in your daily life. Your answer should show how often these experiences happen to you when you **ARE NOT** under the influence of alcohol or drugs. CIRCLE a number from 0% to 100% to show what percentage of the time this happens to you. If it happens 45% of the time, circle both 40% and 50%.

1. Some people have the experience of driving or riding in a car or bus or subway and suddenly realising that they don't remember what has happened during all or part of the trip.

(NEVER) 0% 10 20 30 40 50 60 70 80 90 100 (ALWAYS)

2. Some people find that sometimes they are listening to someone talk and they suddenly realise that they did not hear part or all of what was said.

(NEVER) 0% 10 20 30 40 50 60 70 80 90 100 (ALWAYS)

3. Some people have the experience of finding themselves in a place and having no idea how they got there.

(NEVER) 0% 10 20 30 40 50 60 70 80 90 100 (ALWAYS)

4. Some people have the experience of finding themselves dressed in clothes that they don't remember putting on.

(NEVER) 0% 10 20 30 40 50 60 70 80 90 100 (ALWAYS)

5. Some people have the experience of finding new things among their belongings that they do not remember buying.

(NEVER) 0% 10 20 30 40 50 60 70 80 90 100 (ALWAYS)

6. Some people sometimes find that they are approached by people that they do not know who call them by another name or insist that they have met them before.

(NEVER) 0% 10 20 30 40 50 60 70 80 90 100 (ALWAYS)

7. Some people sometimes have the experience of feeling as though they are standing next to themselves or watching themselves do something and they actually see themselves as if they were looking at another person.

(NEVER) 0% 10 20 30 40 50 60 70 80 90 100 (ALWAYS)

8. Some people are told that they sometimes do not recognise friends or family members.

(NEVER) 0% 10 20 30 40 50 60 70 80 90 100 (ALWAYS)

9. Some people find that they have no memory for some important events in their lives (for example, a wedding or graduation).

(NEVER) 0% 10 20 30 40 50 60 70 80 90 100 (ALWAYS)

10. Some people have the experience of being accused of lying when they do not think that they have lied.

(NEVER) 0% 10 20 30 40 50 60 70 80 90 100 (ALWAYS)

11. Some people have the experience of looking in a mirror and not recognising themselves.

(NEVER) 0% 10 20 30 40 50 60 70 80 90 100 (ALWAYS)

12. Some people have the experience of feeling that other people, objects and the world around them are not real.

(NEVER) 0% 10 20 30 40 50 60 70 80 90 100 (ALWAYS)

13. Some people have the experience of feeling that their body does not seem to belong to them.

(NEVER) 0% 10 20 30 40 50 60 70 80 90 100 (ALWAYS)

14. Some people have the experience of sometimes remembering a past event so vividly that they feel as if they were reliving that event.

(NEVER) 0% 10 20 30 40 50 60 70 80 90 100 (ALWAYS)

15. Some people have the experience of not being sure whether things that they remember happening really did happen or whether they just dreamed them.

(NEVER) 0% 10 20 30 40 50 60 70 80 90 100 (ALWAYS)

16. Some people have the experience of being in a familiar place but finding it strange and unfamiliar.

(NEVER) 0% 10 20 30 40 50 60 70 80 90 100 (ALWAYS)

17. Some people find that when they are watching television or a movie they become so absorbed in the story that they are unaware of other events happening around them.

(NEVER) 0% 10 20 30 40 50 60 70 80 90 100 (ALWAYS)

18. Some people find that they become so involved in a fantasy or daydream that it feels as though it were really happening to them.

(NEVER) 0% 10 20 30 40 50 60 70 80 90 100 (ALWAYS)

19. Some people find that they sometimes are able to ignore pain.

(NEVER) 0% 10 20 30 40 50 60 70 80 90 100 (ALWAYS)

20. Some people find that they sometimes sit staring off into space, thinking of nothing, and are not aware of the passage of time.

(NEVER) 0% 10 20 30 40 50 60 70 80 90 100 (ALWAYS)

21. Some people sometimes find that when they are alone they talk out loud to themselves.

(NEVER) 0% 10 20 30 40 50 60 70 80 90 100 (ALWAYS)

22. Some people find that in one situation they may act so differently compared with another situation that they feel almost as if they were two different people.

(NEVER) 0% 10 20 30 40 50 60 70 80 90 100 (ALWAYS)

23. Some people sometimes find that in certain situations they are able to do things with amazing ease and spontaneity that would usually be difficult for them (for example, sports, work, social situations, etc.).

(NEVER) 0% 10 20 30 40 50 60 70 80 90 100 (ALWAYS)

24. Some people sometimes find that they cannot remember whether they have done something or have just thought about doing this (for example, not knowing whether they have just mailed a letter or have just thought about mailing it).

(NEVER) 0% 10 20 30 40 50 60 70 80 90 100 (ALWAYS)

25. Some people find evidence that they have done things that they do not remember doing.

(NEVER) 0% 10 20 30 40 50 60 70 80 90 100 (ALWAYS)

26. Some people sometimes find writings, drawings, or notes among their belongings that they must have done but cannot remember doing.

(NEVER) 0% 10 20 30 40 50 60 70 80 90 100 (ALWAYS)

27. Some people sometimes find that they hear voices inside their head that tell them to do things or comment on things that they are doing.

(NEVER) 0% 10 20 30 40 50 60 70 80 90 100 (ALWAYS)

28. Some people sometimes feel as if they are looking at the world through a fog so that people and objects appear far away or unclear.

(NEVER) 0% 10 20 30 40 50 60 70 80 90 100 (ALWAYS)

Appendix D-3: PTSD Symptom Scale – Self Report

PSS-SR

Below is a list of problems that people sometimes have after experiencing a traumatic event. Please rate on a scale of 0-3 how much or how often these following things have occurred to you in the last two weeks:

0. Not at all
1. Once per week or less/ a little bit/ one in a while
2. 2 to 4 times per week/ somewhat/ half the time
3. 3 to 5 or more times per week/ very much/ almost always

1. Having upsetting thought or images about the traumatic event that come into your head when you did not want them to	0	1	2	3
2. Having bad dreams or nightmares about the traumatic event	0	1	2	3
3. Reliving the traumatic event (acting as if it were happening again)	0	1	2	3
4. Feeling emotionally upset when you are reminded of the traumatic event	0	1	2	3
5. Experiencing physical reactions when reminded of the traumatic event (sweating, increased heart rate)	0	1	2	3
6. Trying not to think or talk about the traumatic event	0	1	2	3
7. Trying to avoid activities or people that remind you of the traumatic event	0	1	2	3
8. Not being able to remember an important part of the traumatic event	0	1	2	3
9. Having much less interest or participating much less often in important activities	0	1	2	3
10. Feeling distant or cut off from the people around you	0	1	2	3
11. Feeling emotionally numb (unable to cry or have loving feelings)	0	1	2	3
12. Feeling as if your future hopes or plans will not come true	0	1	2	3
13. Having trouble falling or staying asleep	0	1	2	3
14. Feeling irritable or having fits of anger	0	1	2	3
15. Having trouble concentrating	0	1	2	3

16. Being overly alert	0	1	2	3
17. Being jumpy or easily startled	0	1	2	3

Appendix D-4: Demographics for Chapters two, three and four

Demographics

Age:

Gender:

Which ethnic groups do you identify with?
- New Zealand European
- Maori
- Australian
- Aboriginal Australian
- Samoan
- Cook Island Maori
- Tongan
- Niuean
- Chinese
- Indian
- Other such as Dutch, Japanese, Tokelauan. Please state:

What is the highest qualification you have gained?
- NCEA Level 1/School certificate
- NCEA Level 2
- NCEA Level 3/higher school certificate
- Trade certificate
- University Entrance
- Foundation or Bridging Course
- National Certificate or Diploma
- Undergraduate degree
- Honours degree
- Masters degree
- Doctoral degree
- Other

Have you ever lost consciousness for more than half an hour as a result of a knock to the head?
- Yes
- No

Appendix D-5: Vignette Emotion Rating Questionnaire for Chapter two

HOME

While listening to the audio, how much did you notice having each of the following feelings? (please rate to the nearest whole number, where 0 is not at all and 100 is completely).

Shame

0	10	20	30	40	50	60	70	80	90	100
Not at all										Completely

Disgust

0	10	20	30	40	50	60	70	80	90	100
Not at all										Completely

Anxiety

0	10	20	30	40	50	60	70	80	90	100
Not at all										Completely

Embarrassment

0	10	20	30	40	50	60	70	80	90	100
Not at all										Completely

Guilt

0	10	20	30	40	50	60	70	80	90	100
Not at all										Completely

Happiness

0	10	20	30	40	50	60	70	80	90	100
Not at all										Completely

PARK

While listening to the audio, how much did you notice having each of the following feelings? (please rate to the nearest whole number, where 0 is not at all and 100 is completely).

Shame

0	10	20	30	40	50	60	70	80	90	100
Not at all										Completely

Disgust

0	10	20	30	40	50	60	70	80	90	100
Not at all										Completely

Anxiety

0	10	20	30	40	50	60	70	80	90	100
Not at all										Completely

Embarrassment

0	10	20	30	40	50	60	70	80	90	100
Not at all										Completely

Guilt

0	10	20	30	40	50	60	70	80	90	100
Not at all										Completely

Happiness

0	10	20	30	40	50	60	70	80	90	100
Not at all										Completely

Appendix D-6: Vignette Emotion Rating Questionnaire for Chapter four

BANK

While listening to the audio, how much did you notice having each of the following feelings? (please rate to the nearest whole number, where 0 is not at all and 100 is completely).

Shame

0	10	20	30	40	50	60	70	80	90	100
Not at all										Completely

Disgust

0	10	20	30	40	50	60	70	80	90	100
Not at all										Completely

Anxiety

0	10	20	30	40	50	60	70	80	90	100
Not at all										Completely

Embarrassment

0	10	20	30	40	50	60	70	80	90	100
Not at all										Completely

Guilt

0	10	20	30	40	50	60	70	80	90	100
Not at all										Completely

Happiness

0	10	20	30	40	50	60	70	80	90	100
Not at all										Completely

SUPERMARKET

While listening to the audio, how much did you notice having each of the following feelings? (please rate to the nearest whole number, where 0 is not at all and 100 is completely).

Shame

0	10	20	30	40	50	60	70	80	90	100
Not at all										Completely

Disgust

0	10	20	30	40	50	60	70	80	90	100

Not at all										Completely

Anxiety

0	10	20	30	40	50	60	70	80	90	100
Not at all										Completely

Embarrassment

0	10	20	30	40	50	60	70	80	90	100
Not at all										Completely

Guilt

0	10	20	30	40	50	60	70	80	90	100
Not at all										Completely

Happiness

0	10	20	30	40	50	60	70	80	90	100
Not at all										Completely

Appendix D-7: Post-Experiment Questionnaire for Chapters two, three and four

Did the participant appear to have amnesia?
- Yes
- Questionable
- No

Did the participant appear to have dissociative identities?
- Yes
- Questionable
- No

Did the participant's appearance differ in one identity compared to the other?
- Yes
- Questionable
- No

Please select the difference/s noticed
- Affect
    - Yes
    - No
- Behaviour
    - Yes
    - No
- Body posture
    - Yes
    - No
- Voice Characteristics
    - Yes
    - No
- Facial characteristic
    - Yes
    - No

To what degree did the participant appear to be feigning DID symptoms?
- Not at all
- Somewhat
- Quite a lot
- Completely

Please record any other thoughts/feelings/impressions that you had:

Appendix D-8: Demographics for Chapter five

Demographics

Age:

Gender:

Relationship Status
- Single
- In a relationship
- Married

Which ethnic groups do you identify with?
- New Zealand European
- Maori
- Australian
- Aboriginal Australian
- Samoan
- Cook Island Maori
- Tongan
- Niuean
- Chinese
- Indian
- Other such as Dutch, Japanese, Tokelauan. Please state:

What is the highest qualification you have gained?
- NCEA Level 1/School certificate
- NCEA Level 2
- NCEA Level 3/higher school certificate
- Trade certificate
- University Entrance
- Foundation or Bridging Course
- National Certificate or Diploma
- Undergraduate degree
- Honours degree
- Master's degree
- Doctoral degree
- Other

Have you been diagnosed with any mental health difficulties?
- No
- Yes

If yes, and you know which one/s please select those that apply:
- Dissociative Identity Disorder
- Other dissociative disorder
- Schizophrenia or schizoaffective disorder
- Other psychotic disorder (e.g., delusional disorder)
- Personality disorder

- Post-traumatic stress disorder
- Somatic symptom disorder
- Mood disorder (e.g., depression, bipolar)
- Eating disorder (e.g., binge eating, anorexia, bulimia nervosa)
- Autism spectrum disorder
- Attention deficit hyperactivity disorder
- Anxiety disorder (e.g. social anxiety)
- Substance use disorder (e.g. alcohol, common drugs)
- Obsessive compulsive disorder
- Other:

Have you ever lost consciousness for more than half an hour as a result of a knock to the head?

- Yes
- No

Appendix D-9: Child Dissociative Checklist (CDC)

Child Dissociative Checklist (CDC), Version 3

Frank W. Putnam, MD

Date: _____ Age: _____ Sex: M F Identification: _____

Below is a list of behaviors that describe children. For each item that describes your child NOW or WITHIN THE PAST 12 MONTHS, please circle 2 if the item is VERY TRUE of your child. Circle 1 if the item is SOMEWHAT or SOMETIMES TRUE of your child. If the item is NOT TRUE of your child, circle 0.

0	1	2	1. Child does not remember of denies traumatic or painful experiences that are know to have occurred.
0	1	2	2. Child goes into a daze or trance-like state at times or often appears "spaced-out." Teachers may report that he or she "daydreams" frequently in school.
0	1	2	3. Child shows rapid changes in personality. He or she may go from being shy to being outgoing, from feminine to masculine, from timid to aggressive.
0	1	2	4. Child is unusually forgetful or confused about things that he or she should know, e.g. may forget the names of friends, teachers or other important people, loses possessions or gets easily lost.
0	1	2	5. Child has a very poor sense of time. He or she loses track of time, may think that it is morning when it is actually afternoon, gets confused about what day it is, or becomes confused about when something has happened.
0	1	2	6. Child shows marked day-to-day or even hour-to-hour variations in his or her skills, knowledge, food preferences, athletic abilities, e.g. changes in handwriting, memory for previously learned Information such as multiplication tables, spelling, use of tools or artistic ability.
0	1	2	7. Child shows rapid regressions in age-level behavior, e.g. a Twelve year-old starts to use baby-talk sucks thumb or draws like a four-year old.
0	1	2	8. Child has a diffi cult time learning from experience, e.g. explanations, normal discipline or punishment do not change his or her behavior.
0	1	2	9. Child continues to lie or deny misbehavior even when the evidence is obvious.

0	1	2	10. Child refers to himself or herself in the third person (e.g. as she or her) when talking about self, or at times insists on being called by a different name. He or she may also claim that things that he or she did actually happened to another person.
0	1	2	11. Child has rapidly changing physical complaints such as headache or upset stomach. For example, he or she may complain of a headache one minute and seem to forget about it the next.
0	1	2	12. Child is unusually sexually precocious and may attempt age inappropriate sexual behaviour with other children or adults.
0	1	2	13. Child suffers from unexplained injuries or may even deliberately injure self at times.
0	1	2	14. Child reports hearing voices that talk to him or her. The voices may be friendly or angry and may come form “imaginary companions” or sound like the voices of parents, friends or teachers.
0	1	2	15. Child has a vivid imaginary companion or companions. Child may insist that the imaginary companion(s) is responsible for things that he or she has done.
0	1	2	16. Child has intense outbursts of anger, often without app arent cause and may display unusual physical strength during these episodes.
0	1	2	17. Child sleepwalks frequently.
0	1	2	18. Child has unusual night-time experiences, e.g. may report seeing “ghosts” or that things happen at night that he or she can’t account for (e.g. broken toys, unexplained injuries).
0	1	2	19. Child frequently talks to him or herself, may use a different voice or argue with self at times.
0	1	2	20. Child has two or more distinct and separate personalities that take control over the child’s behavior.

Appendix D-10: MINI International Neuropsychiatric Interview

MINI International Neuropsychiatric Interview

Ask for an example of each question answered positively. Only code YES if the example clearly show a distortion of thought, or of perception, if they are not culturally appropriate

Now I am going to ask about unusual experiences that some people have;

L1	**a**	Have you ever believed that people were spying on you, or that someone was plotting against you, or trying to hurt you?	**Yes**	**No**
	b	***IF YES,*** do you currently believe these things?	**Yes**	**No**
L2	**a**	Have you ever believed that someone was reading your mind or could hear your thoughts, or that you could actually read someone's mind or hear what another person was thinking?	**Yes**	**No**
	b	***IF YES,*** do you currently believe these things?	**Yes**	**No**
L3	**a**	Have you ever believed that someone or some force outside of yourself put thoughts in your mind that were not your own, or made you act in a way that was not your usual self? Have you ever felt that you were possessed? ***IF YES****, ask for examples and discount any that are not psychotic*	**Yes**	**No**
	b	***IF YES***, do you currently believe these things?	**Yes**	**No**
L4	**a**	Have you ever believed that you were being sent special messages through the TV, radio, or newspaper, or that a person you did not personally know was particularly interested in you?	**Yes**	**No**
	b	***IF YES,*** do you currently believe these things?	**Yes**	**No**
L6	**a**	Have you ever heard things other people could not hear, such as voices?	**Yes**	**No**
	aa	***IF YES,*** did you hear a voice commenting on your thoughts or behaviour, or did you hear two or more voices talking to each other?	**Yes**	**No**
	b	***IF YES to L6.a,*** did have you heard these things in the past month?	**Yes**	**No**
L7	**a**	Have you ever had visions when you were awake or have you ever seen things other people could not see? *Check to see if these are culturally inappropriate*	**Yes**	**No**
	b	***IF YES***, have you seen these things in the past month?	**Yes**	**No**

IF YES TO ANY OF THE ABOVE QUESTIONS (L1 – L7)

How long have you been experiencing -***examples***- for? **Duration_____.**

N1	**a**	Do you lack motivation to do things, or are you uninterested in things you once enjoyed?	**Yes**	**No**
	b	IF YES, do you find you spend most of the day doing nothing?	**Yes**	**No**
N2	**a**	Do you experience few or no emotions at events, or do your emotions lack in intensity?	**Yes**	**No**

Observers Judgement (do not read)

L8	Is the person currently exhibiting incoherence, disorganized speech, or marked loosening of associations	**Yes**	**No**
L9	Is the person currently exhibiting disorganized or catatonic behaviour?	**Yes**	**No**
L10	Are negative symptoms of Schizophrenia e.g. significant affective flattening, poverty of speech (alogia), or an inability to initiate or persist in goal-directed activities (avolition) prominent during the interview?	**Yes**	**No**

Comments;

Appendix D-11: Scale to assess Meaning Making

Scale to assess meaning making:

1. This past event has had a big impact on me

   Yes/No

2. I feel I have grown as a person since experiencing this past event

   Yes/No

3. Having had this experience, I have more insight into who I am and what is important to me

   Yes/No

4. Having had this experience, I have learned more about what life is all about

   Yes/No

5. Even when I think of that event now, I think about how it has affected me

   Yes/No

6. I have often spent time thinking about what this event means to me

   Yes/No

Appendix D-12: Memory Characteristic Questionnaire

Memory Title:

Age at event:

Memory Characteristics Questionnaire:

1. **My memory for this event is**

1	2	3	4	5	6	7
Dim						Sharp/clear

2. **My memory for this event is**

1	2	3	4	5	6	7
Black and white						Entirely Colour

3. **My memory for this event involves visual detail**

1	2	3	4	5	6	7
Little or none						A lot

4. **My memory for this event involves sound**

1	2	3	4	5	6	7
Little or none						A lot

5. **My memory for this event involves smell**

1	2	3	4	5	6	7
Little or none						A lot

6. **My memory for this event involves touch**

1	2	3	4	5	6	7
Little or none						A lot

7. My memory for this event involves taste

1	2	3	4	5	6	7
Little or none						A lot

9. My memory for the event is

1	2	3	4	5	6	7
Sketchy						Very detailed

10. Order of events is

1	2	3	4	5	6	7
Confusing						Comprehensible

13. My memory for the location where the event takes place is

1	2	3	4	5	6	7
Vague						Clear/distinct

15. Relative spatial arrangement of objects in my memory for the event is

1	2	3	4	5	6	7
Vague						Clear/distinct

16. Relative spatial arrangement of people in my memory for the event is

1	2	3	4	5	6	7
Vague						Clear/distinct

17. My memory for the time when the event takes place is

1	2	3	4	5	6	7
Vague						Clear/distinct

24. In this event I was

1	2	3	4	5	6	7

A spectator A participant

25. At the time, the event seemed like it would have serious implications

1 2 3 4 5 6 7

Not at all Definitely

27. I remember how I felt at the time when the event took place

1 2 3 4 5 6 7

Not at all Definitely

28. Feelings at the time were

1 2 3 4 5 6 7

Negative Positive

29. Feelings were

1 2 3 4 5 6 7

Not intense Very intense

30. As I am remembering now, my feelings are

1 2 3 4 5 6 7

Not intense Very intense

31. I remember what I thought at the time

1 2 3 4 5 6 7

Not at all Clearly

32. This memory reveals or says about me

1 2 3 4 5 6 7

Not much A lot

33. Overall, I remember this event

1	2	3	4	5	6	7
Hardly						Very well

35. I remember what I thought after the event

1	2	3	4	5	6	7
Not at all						Yes, clearly

36. Do you have any doubts about the accuracy of your memory for this event?

1	2	3	4	5	6	7
A great deal of doubt						No doubt whatsoever

37. Since it happened, I have thought about this event

1	2	3	4	5	6	7
Not at all						Many times

38. Since it happened, I have talked about it

1	2	3	4	5	6	7
Not at all						Many times

39. About when did this event happen? Circle one:

Just today/yesterday/few days ago/last week/few weeks ago/last month/few months ago/last year/longer

Appendix E

Study Stimuli

Appendix E-1: Practice Vignette Items

Item 1:

You went to the car

Item 2:

This is your hat

Item 3:

The people walk past your

Appendix E-2: Vignette transcripts for Chapter two

Home Vignette

1 You are in your house

2 You turn on your computer and look through websites

3 You notice an advert for cheap clothing

4 You notice yourself getting interested in its content

5 You become more excited in the site as your interest increases

6 Soon you are looking at the different specials

7 You click a link to keep browsing

8 Then, a respected friends of yours phones

9 They hear your enthusiasm

10 You tell them about the cheap clothes you've found

11 You quickly click on the icon for more specials

12 Your friend shares your excitement

13 You get the impression they are also interested in the specials

14 You feel good sharing the idea with your friend

Palk Vignette

1 You are walking through a local park

2 You notice a café and wonder whether to get a coffee

3 You decide against it and continue along the path

4 You approach a duck pond

5 You sit on the bench beside the pond

6 You feed the ducks

7 You notice the wind start to pick up and put your jacket on

8 You put on the jacket and begin to feel more comfortable

9	You get off the park bench and continue walking through the park
10	You see many people picnicking
11	You decide you are hungry and head to the café
12	You realise it has started raining lightly
13	You get an umbrella from your bag
14	You leave the park

Appendix E-3: Vignette transcripts for Chapter four

Bank Vignette

1 You walk into your local bank

2 You walk up to a free Teller

3 You ask to withdraw $100

4 You notice the Teller staring at your face

5 The Teller begins to smirk

6 They point and say you have nasal mucus on your cheek

7 You quickly get a tissue to wipe your face clean

8 As you do so, another Teller laughs mockingly at you

9 You wipe the mucus off

10 You feel vulnerable, inferior and exposed

11 You wish you could dig yourself into a hole

12 You take the $100 in a rush and head for the door

13 You can sense the Tellers talking about you

14 You leave the bank

Supermarket Vignette

1 You go into your local supermarket

2 You walk through the fruit and vegetable aisle

3 You briefly stop to place apples in your trolley

4 You suddenly remember needing to meet a friend at the restaurant next door

5 You quickly turn the corner into the next aisle

6 You feel your trolley bang into something

7 You realise you have hit a small child

8 The child starts to cry and their mother starts screaming at you

9	She berates you for being so careless
10	You see others in the aisle looking judgingly at you
11	You apologise to the mother but others begin to criticise you
12	You quickly try to get away from the situation
13	You go to the self-checkout machine to buy the apples
14	You leave the park

Appendix E-4: Instructions for behavioural task

Behavioural Tasks 1:

In this task I am going to get you to do some activities that assess how the brain uses information in order to complete tasks. We will ask you some questions about the tasks later on. First, I would like you to take your mobile phone out, put it on silent and place it next to the pot plant. Second, I would like you to retrieve that book/brochure from the table, which is under some papers. Turn to page 12 and study the picture of the three shapes which is on the separate piece of paper. Now, following the instructions above the images, I would like you to draw the shapes on this blank piece of paper. Then colour the circle in blue, the triangle in red and the square in green using the crayons. Now, using your favourite coloured pen of this available set, write your first name under the circle and your birthday under the square. Now, what memory associated with your life comes to mind when you see the finished picture? When you have one, I would like you to spend fifteen seconds visualizing this memory.

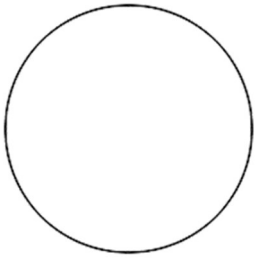
Behavioural Tasks 2:

First, trace a picture of a dog using the blue pen. Second, fill those three cups with water to the level marked on the side of each cup. Then, line them up in order from the least amount of water to the most. Now, I would like you to create an origami model of a finger pointer. Follow these instructions to do so. Now, I would like you to view these photos of people and identify them while pointing with the origami finger. Do you know who these people are? Could you rank them from your most to least liked? Finally, I would like you to state which person you see as being most similar to you. Could you provide a reason for your decision?

Appendix E-5: Drawing Shape Instructions

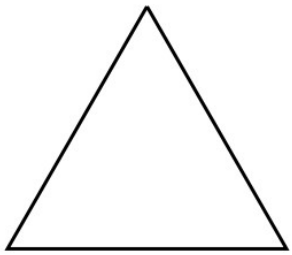
Circle Drawing Instructions

Starting from the top of the circle, where on a clock the point would be represented by the number 12, circle the pen around in a clockwise motion, eventually joining with the top of the shape.



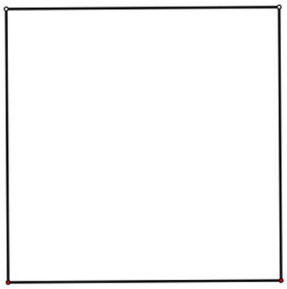
Triangle Drawing Instructions

Starting from the top of the triangle, bring the pen down diagonally to the right bottom corner. Next, bring the pen along to the left corner. Finally, draw the pen up diagonally to the centre of the shape so it joins with the first drawn point.



Square Drawing Instructions

Starting from the top left corner of the square, draw a straight line across to the right corner. Next, bring the pen down and stop at the bottom right corner. Then bring the pen across to the bottom left corner. Last, join the remaining points with a line in order to create the final side of the square.



Appendix E-5: Tracing Image

Appendix E-6: Instructions to Make Origami Finger Pointer

1. With the top right corner, fold it over to the bottom left corner
2. With the left top corner, fold it to the bottom left corner
3. With the middle right corner, fold it so it meets the bottom left corner.
4. Fold the top right corner to the bottom left corner
5. With the right corner, fold it over fully, and then undo it so only a crease is left
6. With the thicker part, roll it down so it folds in the middle
7. Roll it over twice more and tuck in the remaining flap

Appendix E-7: Celebrity Face Images

Appendix E-8: Recognition task stimuli for Chapter two

1. Did you walk up to the duck pond?
2. Did you walk up to the pet store?
3. Did you leave a park?
4. Did you exit a taxi?
5. Did you notice the wind start to pick up?
6. Did you notice the music playing in the bar?
7. Did you put on a jacket?
8. Did you eat a sandwich?
9. Did you feel hungry?
10. Did you feel ignored?
11. Did you turn on the computer?
12. Did you turn over the leaflet?
13. Did you interact with the friend?
14. Did you interact with the cousin?
15. When you told your friend about the specials, did they become interested?
16. When you told your friend about the specials, did they sound distressed?
17. When you interacted with the person, were you in your house?
18. When you interacted with the person, were you in your garden?
19. Were the specials about clothes?
20. Were the specials about make-up?
21. Did you feel good?
22. Did you feel moral?
23. Did you feel hungry ?

24. Did you feel broken ?

25. Did you share the specials with your friend?

26. Did you divide the money amongst your siblings?

27. Did you get an umbrella from your bag?

28. Did you take a photo with your camera?

29. Did you look through websites?

30. Did you gaze through the fence?

31. Did you notice the café?

32. Did you see the gym?

33. Were people phoning?

34. Were people visiting?

35. Were people picnicking?

36. Were people cycling?

37. Did you click a link?

38. Did you play a game?

39. Did you walk through the park?

40. Did you move around the gate?

Appendix E-9: Recognition task stimuli for Chapter three

1. Did you paint over the lines?
2. Did you colour in the shapes?
3. Did you point to the pictures?
4. Did you remove the photos?
5. Did you put something by the pot plant?
6. Did you put something under the keyboard?
7. Did you put something in the cup?
8. Did you put something over the chair?
9. Were you asked to think of what memory came to mind when you saw your picture?
10. Were you asked to think about your favourite toy from childhood?
11. Were you asked to say which person was the most similar to you?
12. Were you asked to say which people were in your favourite movies?
13. Did you see a photo of a triangle?
14. Did you see a photo of a diamond?
15. Did you see a photo of Brad Pitt?
16. Did you see a photo of George Clooney?
17. Was the book under the papers?
18. Was the book on top of the pen?
19. Was the book on the floor?
20. Was the book next to the door?
21. Did you put your mobile on silent?
22. Did you take your shoes off?
23. Did you trace a dog?

24. Did you outline a star?

25. Did you choose your favourite colour?

26. Did you choose your favourite food?

27. Did you rank the photos based on their likeability?

28. Did you rank the photos based on their generosity?

29. Did you create some drawings of shapes?

30. Did you create some pictures of buildings?

31. Did you create an origami model?

32. Did you create a house made of cards?

33. Did you colour in pictures?

34. Did you cut through paper?

35. Did you pour water?

36. Did you play with play-dough?

37. Did you write your name?

38. Did you write your phone number?

39. Did you write who was the most similar to you?

40. Did you write who was the least similar to you?

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Curriculum Vitae

Rosemary Marsh was born on January 4th, 1991 in Canberra, Australia. She moved to Porirua, New Zealand as an infant and attended primary school in Porirua (Papakowhai School) and Fareham, United Kingdom (Wickham Church of England Primary School), and high school in Porirua (Aotea College). In 2009 she began her BA (Hons) in Psychology at the University of Otago in Dunedin, New Zealand. After graduating in 2013, she moved to Christchurch, New Zealand to begin her PhD at the University of Canterbury. In 2015 she joined the Double Degree PhD programme at the University of Groningen in Groningen, the Netherlands and was accepted into the Postgraduate Diploma in Clinical Psychology at the University of Canterbury. She is currently registered as an intern clinical psychologist, working for the Department of Corrections.